

WHAT DIGITAL Camera

OCTOBER
2015

WHAT TO BUY



The new kit on the block

DSLR, CSC or compact? We test the latest models from **Canon**, **Panasonic** and **Sony**



Field
test

Nikon 80-400mm

Get closer to
the action



Technique

Slowly does it

Long exposures
with your Olympus

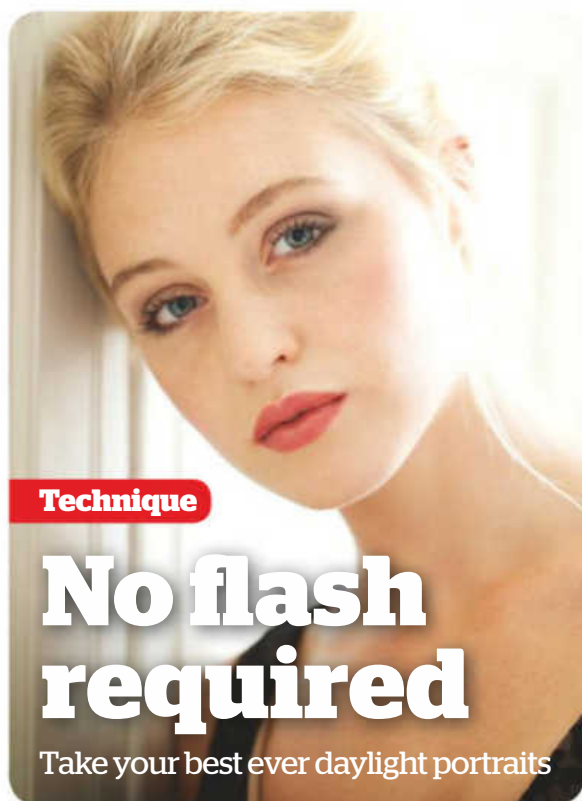


Full
test

Fuji

XF16mm f/1.4

Fast, wide and super-sharp



Technique

No flash required

Take your best ever daylight portraits



Five
of the
best

Prime movers

The pick of the 50mm crop



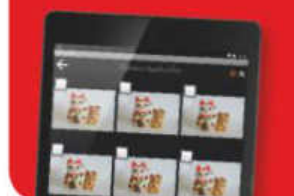
Wildlife technique

How to make the
most of seal season

Technique

The smart solution

Control your camera
with your phone or pad



The UK's most comprehensive listings

Wondering about the latest gear? Find out how we rate 523 cameras and lenses

D7200



24.2

MEGAPIXEL



FOCUS
POINTS

ISO

100-25600

ISO RANGE



BUILT-IN WIFI

I AM AMBITION IN FOCUS

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Photo © Arneke Hartog

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Tests you can trust

To ensure the camera you buy doesn't disappoint, every camera that passes through the hands of What Digital Camera's technical team is put through a series of tests. From high-spec DSLRs through to entry-level compacts, they are subjected to a series of rigorous tests in our lab, with results analysed by the very best industry software. This makes our reviews the most authoritative in the UK. We test for colour – different sensors and camera image processors can interpret colour differently. We then get down to the nitty-gritty of resolution, with our lab tests showing us exactly how much detail each camera can resolve. Then we look at Image Noise. Finally, we get out and shoot with every camera and lens in real-world conditions just as you will, to find out how they perform.



SONY α7R

Just as this issue closed for press, our review sample of the all-new Sony Alpha 7R II arrived on our doorstep. Without wasting any time, we headed straight out to capture our first set of sample images to find out just how well its back-illuminated full-frame 42.4MP sensor performs. You can look forward to our full review in next month's issue, but in the meantime we'll leave you to analyse the level of breathtaking detail for yourself.

200%



The A7R II is the new flagship model in Sony's A-series. It boasts a hybrid AF system, five-axis image stabilisation system, silent shooting, 4K video and much, much more.



1



2



3



4



© LY HOANG LONG

5



1 Sigma 24-35mm f/2

£949 www.sigma-imaging-uk.com

Sigma has released pricing and availability for the eagerly awaited 24-35mm f/2 DG HSM | Art lens. Canon fit examples are available now, with Nikon fit lenses to follow.

2 Nikon 200-500mm f/5.6

£1179 www.nikon.co.uk

This month has seen the release of three new Nikkor lenses, the AF-S 200-500mm f/5.6E ED VR being the largest. Out to target those who regularly shoot wildlife, birds, planes and sport, it features Sport VR to accurately track fast action and weighs a rather hefty 2.3kg.

3 Gitzo Centre ball heads

From £265 www.gitzo.co.uk

To coincide with the launch of its new Traveler tripod range, Gitzo has announced three centre ball heads. The GH1382TQD is the cheapest, with friction control available on the GH1382QD and GH3382QD models.

4 Environmental images

www.ciwem.org/

The winners of the Atkins CIWEM Environmental Photographer of the Year 2015 were recently announced and were once again a hotbed of engaging and genuinely thought-provoking issues.

5 Nikon 24mm f/1.8 G ED

£629 www.nikon.co.uk

Say hello to the AF-S 24mm f/1.8 ED – a fast FX-format lens that's out to appeal to landscape, interior, architecture and street photographers with its 0.23cm minimum focus distance and lightweight design.

6 Nikon 24-70mm f/2.8

£1849 www.nikon.co.uk

Complementing the trio of new lenses from Nikon is the 24-70mm f/2.8E AF-S ED VR. It looks to improve upon its predecessor by incorporating Nikon's latest VR system that offers four stops of image stabilisation.

6



9 Lowepro Whistler series

From £257 www.lowepro.co.uk

Whistler is a versatile, four-season backpack that comes in two sizes – 350 AW and 450 AW. It has a rigid internal structure and is designed to keep gear safe from the elements.

10 Lowepro Photo Sport II

From £118 www.lowepro.co.uk

The updated Photo Sport II series offers camera and personal gear portability when engaged in aerobic sports or activities. There's the BP 200 AW (£118) or the larger BP 300 AW (£147) to choose from and they're both available in black or blue.

11 Tamron 18-200mm

£169 www.intro2020.co.uk

The 18-200mm f/3.5-6.3 Di II VC lens from Tamron is a versatile, all-in-one zoom suitable for a wide variety of subjects, including landscape, sport, travel, wildlife and portraits. It's available in Canon, Nikon and Sony mounts.

12 Travel photography

www.tpoty.com

There's still time to enter the 2015 Travel Photographer of the Year competition. Entries must be in by 1 October, 2015. There are a variety of categories to choose from, such as Portfolio, One Shot and New talent.

8



9



7



10



11



7 Adobe Camera Raw 9.1.1

Free www.adobe.com

Adobe has announced that Camera Raw 9.1.1 is now available as an update for Photoshop CS6 and Photoshop CC. It offers support for many new cameras like the Sony RX100 IV (see page 74), the Panasonic GX8 (see page 72), and Leica Q, as well as the Pentax K-3 II.

8 Panasonic Lumix FZ330

£499 www.panasonic.co.uk

With a splash and dust-proof construction, the new FZ330 is an attractive option for those after a bridge camera with a long 25-600mm optical zoom and f/2.8 aperture.

12



© TIMOTHY ALLEN

Samsung S34E790C monitor

WWW.SAMSUNG.COM £731

If you spend most of your day camped out in front of a monitor, editing pictures and keeping an eye on work, it makes sense to have the best display possible. Our current pick, for those with a healthy bank balance, is Samsung's gorgeous S34E790C. Its 34in, curved display boasts a 3,440 x 1,440 resolution and it produces stunningly sharp images. Instead of being a dramatic curve, the panel arcs ever so slightly and creates a much more immersive environment. It's hard going back to a normal monitor. Samsung's



Magic Bright mode alters the intensity of the screen's brightness depending on what you're doing; this works well, but the Cinema mode seemed to sacrifice the inkiness of the blacks for the sake of brightness. There are some issues with screen uniformity, especially around the sides, though the impressive input lag makes this

a good choice if your computer doubles as a gaming machine. On the back you'll find two HDMI sockets, three USB 3.0 ports and a headphone jack, along with dual 7W speakers, which should be enough for most users. It also looks particularly snazzy, with a combination of brushed metal and glossy plastic making up the majority of the build. **MP**

Sony Xperia Z4 tablet

WWW.SONY.COM

FROM £499

With its fantastic 2K display, Sony's latest Xperia slate is the Japanese brand's best yet and it's one of the only tablets we've tried that could genuinely tempt us away from an iPad. That screen is the main attraction and it makes viewing and editing pictures a real pleasure. It packs a resolution of 2,560 x 1,600 and Sony's Triluminous tech to give your snaps an extra hit of detail and brightness. Viewing angles are terrific and it even works well in bright sunlight, perfect if you're out and about looking to get some work done. But there's more to this tablet than just the pixel-packed screen. It's waterproof down to depths of 1.5m for 30 mins – just remember to close the flaps – and it's oh so thin. It's light, too, and it might take a while for you to get used to just how featherlight this thing feels in your hands. Powering everything is a Snapdragon 810 processor paired with 3GB RAM and, as you'd expect from such high-end internals, Android 5 Lollipop (overlaid with Sony's fairly light skin) runs like a dream. A great, all-round package. **MP**



Epson EH-LS100000

WWW.EPSON.CO.UK £5,999

It's been a long time since we've been excited about a projector, but Epson's latest number packs a load of fantastic features that makes it one of the ultimate additions to your home cinema. The key feature here is the use of lasers to create the picture, ridding you of those annoying bulbs with limited lifespans that used to

plague projectors. Epson says the lasers will last for 30,000 hours, whereas bulbs were limited to about 4,000. Picture quality is ace – with superb contrast and colour accurately, though we'd expect as much for the £5,999 entrance fee. Set-up is simple,



varying picture modes are plentiful and 3D is an added bonus, though it does lack support for native 4K. **MP**

BOOK REVIEWS WIND OF CHANGE

by John Bulmer

BLUECOAT PRESS £19.99

Wind of Change is a compilation of photojournalist John Bulmer's at times confrontational and searingly honest photographs, each of which is an absorbing account of upheaval and change throughout the 1960s and '70s. Bulmer perhaps does not get enough



credit for just how pioneering his work was within the field of colour photography. His career took him across the world on commission for publications such as *The Sunday Times*, BBC, *National Geographic* and *The Independent*. The breadth of the work he produced is staggering, and with this book readers have an opportunity to absorb just how significant this body of work is. Highly recommended. **OA**

SCHUDE

by Ryan Schude

ROADS PUBLISHING £40

LA-based photographer Ryan Schude is not known for his moderation. Imagine Gregory Crewdson with attention deficit disorder and that should give you a fair idea of what to expect from Schude's prismatic and serried tableaux. That's not a criticism by any means. Schude's work is riotous in



its extravagance, and is a beautiful exploration of pop Americana. Each image is exquisitely crafted. The images work in much the same way in which a magic-eye picture would reveal itself – the more you stare at Schude's images, the more the bigger picture is revealed. This is Schude's first book, and while the image reproduction quality leaves a little to be desired, it's a fitting tribute to a man who works every detail to his utmost satisfaction. **OA**

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sigma-global.com

THINGS TO TRY THIS MONTH

Try this... Shoot from an unusual angle

We're all accustomed to seeing classic plant 'portraits' – so much so that we can forget there are other ways of approaching such a popular subject. David Scrivener, from Kent, decided to take a whole new viewpoint when he placed his camera on its back among this group of bluebells. In order to take the image, he set the lens at its widest focal point of 10mm (equivalent to approximately 15mm in full-frame terms), prefocused to 20cm on manual, and selected a small aperture of f/20 in order to keep everything as sharp as possible from front to back. He used a SB-700 Speedlight to light up the foreground flowers, and the camera was triggered remotely.

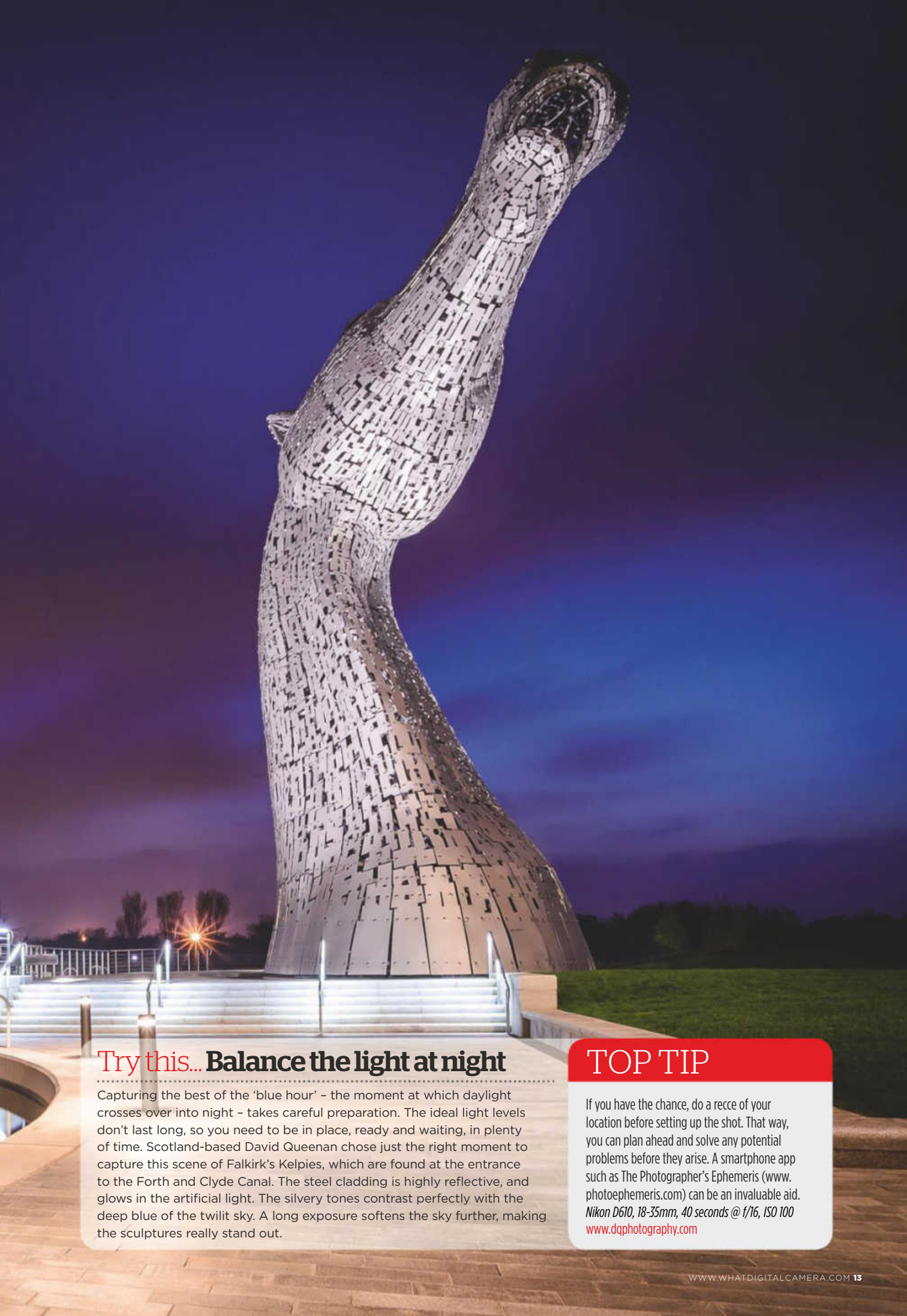
TOP TIP

It may not be bluebell season at the moment, but this technique can be attempted any time of the year. Try practising the effect somewhere accessible, like your back garden, and then plan ahead for an autumn shoot, for example, waiting for orange and gold leaves to fall towards the camera and be lit by the fill flash.

Nikon D7000, 10-20mm, 1/250sec @ f/20, ISO 100







Try this... **Balance the light at night**

Capturing the best of the 'blue hour' – the moment at which daylight crosses over into night – takes careful preparation. The ideal light levels don't last long, so you need to be in place, ready and waiting, in plenty of time. Scotland-based David Queenan chose just the right moment to capture this scene of Falkirk's Kelpies, which are found at the entrance to the Forth and Clyde Canal. The steel cladding is highly reflective, and glows in the artificial light. The silvery tones contrast perfectly with the deep blue of the twilight sky. A long exposure softens the sky further, making the sculptures really stand out.

TOP TIP

If you have the chance, do a recce of your location before setting up the shot. That way, you can plan ahead and solve any potential problems before they arise. A smartphone app such as The Photographer's Ephemeris (www.photoephemeris.com) can be an invaluable aid. *Nikon D610, 18-35mm, 40 seconds @ f/16, ISO 100*
www.dqphotography.com



Try this... Ultra-shallow depth of field

Another flower image that takes a fresh approach, this close-up by Rory McDonald from Cumbria has given the closed osteospermum flower head an almost three-dimensional feel – we feel as if we could reach into the page and touch those water droplets. An aperture of f/4 on a 105mm macro lens helped to achieve this, and the fact that the stalk almost disappears into the similarly toned background helps accentuate the effect of the flower floating in mid air. You can recreate the water droplet effect by using a spray, but be aware that the uniform droplets (as opposed to varied sizes of raindrops) will give the game away.

TOP TIP

Backgrounds are crucial in any photograph, but never more so than with close-up and macro images, as any pinpricks of bright area or harshly contrasting colours will detract from the main subject. Check all around the frame before releasing the shutter.

Nikon D300, 105mm, 1/100sec @ f/4, ISO 250
www.rorymcdonald.co.uk

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Mobile Wi-fi apps

Many cameras now come with built-in Wi-fi connectivity that allows you to connect them to a smartphone or tablet with the help of a first-party app. Here we compare those apps to see which offer the best user experience

WORDS • AUDLEY JARVIS

In the past few years, built-in Wi-fi connectivity has gone from being something of a luxury to a much more standard feature that's now included with most new digital cameras. Wi-fi connectivity in cameras allows your camera to talk to your smartphone or tablet, which allows you to combine your camera's superior image-gathering capabilities with your mobile device's processing power, onboard storage and internet-ready capabilities.

Of course, photographers will always need to upload their images to a desktop computer for editing, but out in the field, the ability to connect your camera to a smartphone or tablet offers a range of benefits. For example, you can

back up your images to your mobile device without having to remove any memory cards or fiddle around with card readers and portable hard drives.

So long as you're in range of a public Wi-fi hotspot or a 3G/4G mobile data signal, you'll also be able to use your connected mobile device to email images or upload them to popular social media sites almost as soon as they've been taken. Last but not least, many apps also allow you to control your camera remotely, which can be useful in a range of situations – from self-portraits to capturing shy wildlife from a safe distance.

In order to make all of this possible, you'll need to download and install one of the first-party

apps offered by the various manufacturers. These are free on the Apple App Store and Google Play, and essentially act as the interface between your camera and your phone or tablet.

Of course, not all apps are created equal, and some are easier to set up and use than others. In addition, some also have greater functionality. We've called in a range of Wi-fi enabled cameras from all the major manufacturers with the intention of using them to test and compare the various first-party mobile connectivity apps. Over the next few pages we'll take a closer look at what's on offer from each and compare how richly featured, reliable and easy-to-use they are.

Getting started

When connecting your mobile device to your camera for the first time, you'll sometimes be asked to input a Wi-fi password, which is usually displayed on your camera at the point of connection. This is to prevent accidental or malicious connections from devices that are not your own. Surprisingly, not all cameras and apps take this approach, with a handful only offering unsecured connections.

Once connected, most apps will typically offer three key functions: the ability to wirelessly transfer images from your camera to your smartphone/tablet; the ability to control your camera remotely; and the ability to add location data to your images using your mobile device's built-in GPS module.

Wireless image transfer

The ability to back images up to your tablet as soon as you shoot them is a useful feature. Most apps allow you to transfer images at their original file size, or reduce it for easier uploading. Raw images can usually be transferred, too – even if your mobile device is unable to display such files.

Remote control

One of the most useful things you can do with apps is to use your mobile device to control the camera. Better apps will allow you to control shutter speed, aperture etc from within the app itself, while others offer no more than a remote shutter button.

Do bear in mind that a camera's Wi-fi range will only extend so far before the signal becomes too weak for your device to pick up. This distance varies depending on your camera along with the strength of your mobile device's antenna – it's not something the apps themselves have any control over.

Location tagging

While some cameras have GPS modules built into them, many do not, which is where your mobile might be able to help. You'll need to enable your location services function on your device before you can use the feature. One important thing to bear in mind is that if you tag an image in a different location from where it was originally shot, then it will be tagged with the GPS data from your new location.

Wi-fi printing

If you've transferred your images to a mobile device and are happy with the way they look, it may be possible to send them directly to your printer over Wi-fi from your tablet or smartphone. You'll need a Wi-fi printer, of course, and will also need to install another first-party app that enables your mobile device to connect to it. Most of the major manufacturers offer at least one printer app, and some offer several. Which one is right for you will depend on the make and model of your printer. Because the

mobile connectivity app that connects your camera to your mobile device acts independently from the printer app that connects your mobile device to your printer, there's no need to stick to a single manufacturer either. In other words, you can use a Nikon camera and a Canon printer – simply download Nikon's Wireless Mobile Utility to connect your camera and your mobile device and something like the Canon Mobile Printing app to send images from your tablet to your printer.

Nikon

Nikon offers a single app called Wireless Mobile Utility (WMU), which is compatible with all Nikon's Wi-fi enabled cameras.

The app itself is not password protected by default, so making your first connection is as easy as switching on your camera's Wi-fi and then selecting it in your device's Wi-fi menu. Once connected, open up the WMU app and head straight for the options menu that's located in the top-right corner of the app's welcome screen. From here, you can rename your camera's SSID to something more user-friendly and set up a WPA2 password to keep any unwanted connections at bay.

Canon

Canon currently offers three apps. Canon Camera Window is for older PowerShot and IXUS compacts, and EOS Remote was designed for Canon's first generation of Wi-fi-

enabled DSLRs. Camera Connect, meanwhile, is designed as a one-size-fits-all replacement for the previous two apps and is compatible with virtually all Canon's Wi-fi enabled cameras.

Use Camera Connect to browse images stored on your camera's memory card and download them direct to your phone/tablet. You can transfer images at their original size or choose to reduce the overall file size. GPS tagging of images via your smartphone is part-supported, though only when the app is used with certain IXUS and PowerShot models – the feature cannot be used with Canon DSLRs or CSCs.

Camera Connect can also control your camera remotely, with separate aperture and shutter speed controls available alongside exposure compensation and ISO dials. For those using certain Canon compacts with fixed zooms, Camera Connect can also be used to control the zoom.

Sony's PlayMemories Mobile allows you to transfer images. To control the camera remotely, you'll need the Smart Remote app





The Fuji Camera Remote app allows you to control your camera from your smartphone

Fujifilm

Fujifilm offers three apps: Camera Application, Camera Remote and Photo Receiver. Which of the three apps is right for you will depend on which Fujifilm camera you own. Camera Remote is more advanced than the other two and is the only app that allows you to control your camera remotely. Unfortunately, it's only compatible with the X-T10, X-E2, X-T1, X100T, X30, S1 and F1000EXR. If you don't own one of these models, you'll need to use the less advanced Camera Application app. While this lacks remote control, it does offer image transfer and GPS tagging. Photo Receiver, meanwhile, is the most basic of the three and has no GPS function. It does work with most Fujifilm cameras though.

Pentax

Pentax only offers one app, but it's a good one. Image Sync allows you to control your camera remotely, with a generous range of controls including shutter speed, aperture, white balance, exposure compensation and ISO. User settings can be quickly overridden by pressing the green button in the bottom right-hand-corner, which effectively puts the camera into fully automatic mode. Unfortunately, there's no way to record video remotely, though. Images can be wirelessly transferred from your camera to your mobile device at their original size, but there's no way of making the files smaller.

Panasonic

Panasonic currently has three apps, although Lumix Remote and Lumix

Link are largely obsolete. Image App, meanwhile, replaces both of the above and is compatible with all Lumix Wi-Fi cameras.

The app features a good range of options. Still images can be transferred from your camera to your smartphone either individually or in batches, with a choice of three sizes: original, medium and small. MP4-format movies can also be transferred, but AVCHD movie files cannot. Geotagging of captured images is also supported.

In its remote control mode, Image App offers a multitude of controls, including shutter speed and aperture dials, white balance, exposure compensation, ISO sensitivity and AF mode. In addition, a Q.Menu button allows you to change settings such as image quality, video quality, photo styles, filter effect, aspect ratio, and flash mode. Image App also allows you to record video remotely.

Sony

Sony offers a number of apps, but in terms of connecting to a mobile device, the one you'll need is called Remote App: PlayMemories Mobile.

Sony Wi-Fi cameras create a password-protected wireless network by default, so before you can use the app you'll need to input the Wi-Fi password into your mobile device – you'll find it in the Wi-Fi settings menu of your Sony camera. From here, things do unfortunately get a little convoluted. You can choose to transfer images by selecting that option directly from the camera's internal Wi-Fi menu. However, should you want to control

THIRD-PARTY WI-FI SOLUTIONS

If your camera doesn't come with built-in Wi-Fi, then there are a number of independent solutions on the market that will give you at least some of the functionality enjoyed by Wi-Fi cameras. The best known of these are the Eye-Fi Mobi range of Wi-Fi memory cards. In addition to storing up to 32GB of images and video, Eye-Fi cards are also able to generate their own password-protected Wi-Fi network. While you can't use Eye-Fi cards to control your camera remotely, you can use them to wirelessly transfer images to your computer and mobile device. You can also set them up to sync image across all of your devices – desktop and mobile. In addition to Eye-Fi, other reputable manufacturers of Wi-Fi SD cards include Toshiba FlashAir cards and the Transcend range of Wi-Fi SD cards.



the camera remotely, you'll need to open the Smart Remote app, which is found within the Applications menu. Simply opening the Remote PlayMemories Mobile app on your tablet won't give you access to remote control features.

Once in remote-shooting mode, options are fairly limited if you're using anything other than one of Sony's 'lens-style cameras' (QX100, QX30, QX10). In fact, paired with a regular Sony SLT or CSC camera, the only thing you can alter via the app is exposure compensation. If you do have one of the aforementioned Sony lens-style cameras, the app will give you a much broader spread of controls, including shutter speed and aperture. Images on your camera can be transferred to your tablet at their original size, or reduced to 2MP or VGA quality.

Samsung

Samsung was an early adopter of Wi-Fi cameras, so it's no surprise that the company has a number of apps. Mobile Link and Remote Viewfinder are largely obsolete now. Taking their place is Samsung Smart Camera, which combines the image transfer and remote-shooting attributes of the other two into a single app that's compatible with the majority of Samsung Wi-Fi cameras. Samsung Camera Manager is a more recent app that adds Bluetooth connectivity for use with models such as the NX1 and NX500.

Camera Manager is a richly featured app with a well-signposted and easy-to-use interface. You can use it to transfer images from your camera to your mobile device, but only at their original size. If you want to reduce the size of images, you'll need to use another app. Location tagging via your mobile device's GPS module is also supported.

Olympus

Olympus currently has two apps for smartphone and tablet users: Olympus Track and Olympus Image Share. The first is a GPS tagging app designed purely for the TG-3 and TG-860 waterproof compacts. Image Share is a more advanced app that offers image transfer, remote control, GPS tagging and the application of Olympus Creative Filters to captured images. Image Share is compatible with all Olympus Wi-Fi cameras.

Canon
Camera
Connect

WWW.CANON.CO.UK/APPS

Our experience with the Canon Camera Connect app was somewhat frustrating. While we had no problem connecting to an Android smartphone running KitKat, with a tablet running the latest 5.1.1 build of Lollipop we couldn't get the two devices to talk to each other. User reviews on Google Play confirm that we aren't alone in this. It's hard to say whether this is a fault of the app itself or a more general problem with Lollipop. Connection issues aside, app functionality isn't bad and we appreciated being able to take control of shutter speed and aperture while shooting remotely in manual mode. That said, a few more advanced controls as seen on other first-party apps certainly wouldn't go amiss.

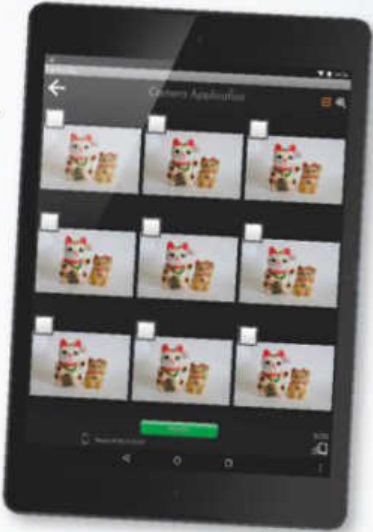


KEY SPECS	MOBILE PLATFORMS	iOS & Android
	REMOTE STILL CAPTURE	Yes
	SHUTTER SPEED/APERTURE CONTROLS	Yes
	REMOTE VIDEO CAPTURE	No
	IMAGE TRANSFER SIZE	Original, optimised for mobile
	GPS TAGGING	PowerShot & IXUS models only, not available on EOS cameras
	TESTED WITH	Canon EOS 70D

Nikon
Wireless
Mobile Utility

WWW.NIKON.CO.UK

We had no problems connecting any of our Android or Apple mobile devices to our D750 using its built-in Wi-fi and the Wireless Mobile Utility app. The WMU's interface is clean and simple, making it easy to use. The remote shooting side of things is rather limited, though, and lacks any ability to remotely control shutter speed, aperture, exposure compensation or ISO as seen on many other first-party mobile apps. That said, the touch-to-focus AF point works well and response times are near instantaneous, too. Downloading images from your camera is much better implemented, with options to download images at their original file size, as well as a 'recommended' size or in VGA quality.



KEY SPECS	MOBILE PLATFORMS	iOS and Android
	REMOTE STILL CAPTURE	Yes
	SHUTTER SPEED/APERTURE CONTROLS	No
	REMOTE VIDEO CAPTURE	No
	IMAGE TRANSFER SIZE	Original, Recommended, VGA
	GPS TAGGING	Yes
	TESTED WITH	Nikon D750

Fujifilm
Camera
Application

APP.FUJIFILM-DSC.COM

While we found the connection process to be fairly straightforward, there's no password protection available, which means there's no way to prevent other users of the app from connecting to your camera. Unlike the more advanced Camera Remote app, Fuji's Camera Application app doesn't support remote shooting and is limited to image transfer duties. That said, the interface is intuitive, which makes using the app pretty straightforward. Batch transfers are limited to no more than 30 images totalling 2GB in size, and images can only be transferred at their original size, with no re-sizing options offered. GPS tagging is also supported.



KEY SPECS	MOBILE PLATFORMS	iOS & Android
	REMOTE STILL CAPTURE	Only with selected Fuji cameras
	SHUTTER SPEED/APERTURE CONTROLS	Only with selected Fuji cameras
	REMOTE VIDEO CAPTURE	Only with selected Fuji cameras
	IMAGE TRANSFER SIZE	Original size only
	GPS TAGGING	Only with selected Fuji cameras
	TESTED WITH	Fuji X-A2

Pentax
Image Sync

WWW.RICOH-IMAGING.CO.UK

We tested the app with the Pentax K-S2, which creates a password-protected Wi-fi network. You'll need to input this password into the Image Sync app before you can connect your mobile device. Thankfully, the password is easy to find within the camera's Wi-fi menu and the app will remember it. Once up and running, Image Sync is undoubtedly one of the better first-party apps, being both richly featured and easy to use. The depth of camera setting controls when used in remote control mode particularly impressed, with the app providing white balance and ISO options in addition to basic shutter speed and aperture controls. In fact, the only thing the app really lacks is any kind of GPS tagging.



KEY SPECS	MOBILE PLATFORMS	iOS & Android
	REMOTE STILL CAPTURE	Yes
	SHUTTER SPEED/APERTURE CONTROLS	Yes
	REMOTE VIDEO CAPTURE	No
	IMAGE TRANSFER SIZE	Original size only
	GPS TAGGING	No
	TESTED WITH	Pentax K-S2

Panasonic Image App

WWW.PANASONIC.NET

Panasonic has clearly invested a great deal of time and effort into the creation of its Image App. The app is not password protected by default, but using the Lumix G7 we were able to easily set one up using the in-camera Wi-fi menu. Once your mobile device has this password stored, you won't have to input it again. Alternatively, if your Lumix camera supports it, then you can also use NFC to connect the two devices together. Once connected, the image transfer and remote control aspects of the app are both fully realised, each coming with a stack of options that allow you to take full control over your camera's settings. Overall, it's a very well thought out and nicely designed app that's also easy to use.



KEY SPECS	MOBILE PLATFORMS	iOS & Android
	REMOTE STILL CAPTURE	Yes
	SHUTTER SPEED/APERTURE CONTROLS	Yes
	REMOTE VIDEO CAPTURE	Yes
	IMAGE TRANSFER SIZE	Original, medium, small
	GPS TAGGING	Yes
	TESTED WITH	Lumix G7

Sony PlayMemories Mobile

WWW.SONY.NET/PMC

The way Sony implements the Wi-fi functionality of its cameras is a bit long-winded. You have to use the in-camera menu to decide whether you want to transfer images or control the camera remotely – you can't work from within the app itself. This means you have to connect once to control the camera remotely, then break that connection in order to re-connect and transfer images to your smartphone. While we appreciate the flexibility of being able to reduce the size of transferred images, the remote control element of the Remote app is about as basic as it gets – unless you're using one of Sony's QX 'lens-style' cameras, in which case functionality is much better.



KEY SPECS	MOBILE PLATFORMS	iOS & Android
	REMOTE STILL CAPTURE	Yes
	SHUTTER SPEED/APERTURE CONTROLS	QX 'lens-style' models only
	REMOTE VIDEO CAPTURE	QX 'lens-style' models only
	IMAGE TRANSFER SIZE	Original, 2MP, VGA
	GPS TAGGING	No
	TESTED WITH	Sony A7

Samsung Camera Manager

WWW.SAMSUNG.COM

We used NFC to connect the Samsung NX1 to our tablet, and it worked first time. After this initial success, however, we found establishing a connection wasn't always straightforward and we regularly found ourselves waiting for the two devices to iron out their differences and start talking. Once connected, however, the Camera Manager app is one of the better ones out there. Remote shooting mode particularly impresses, with a generous range of controls including shutter speed and aperture, white balance, ISO, exposure compensation, drive mode, metering mode, still image size, movie quality, and flash – all on one screen. In addition to shooting still images, you can also use the app to record video remotely.



KEY SPECS	MOBILE PLATFORMS	iOS and Android
	REMOTE STILL CAPTURE	Yes
	SHUTTER SPEED/APERTURE CONTROLS	Yes
	REMOTE VIDEO CAPTURE	Yes
	IMAGE TRANSFER SIZE	Original
	GPS TAGGING	Yes
	TESTED WITH	Samsung NX1

Olympus Image Share

WWW.APP.OLYMPUS-IMAGING.COM

Image Share is a well-rounded app that offers image transfer, remote control, geotagging and image-editing tools. While the image-editing functions are actually limited purely to the application of Olympus Creative Filters, other aspects of the app are much more fully featured. We were particularly impressed with the degree of control over camera settings the app gave us when used in remote control mode. In addition to shutter speed and aperture controls, we were also able to access a number of more advanced camera settings including sensitivity, white balance, drive mode, plus the self-timer and time-lapse mode. Image transfer is similarly detailed, with a generous choice of image transfer size options to choose from.



KEY SPECS	MOBILE PLATFORMS	iOS and Android
	REMOTE STILL CAPTURE	Yes
	SHUTTER SPEED/APERTURE CONTROLS	Yes
	REMOTE VIDEO CAPTURE	No
	IMAGE TRANSFER SIZE	Original, 2048x1536, 1920x1440, 1600x1200, 1024x768
	GPS TAGGING	Yes
	TESTED WITH	Olympus OM-D E-M5 II

Never miss a moment again

Photographer and journalist **Damien Demolder** explores the decisive moment and how to make the impossible easily achievable

It was Henri Cartier-Bresson who coined the phrase 'the decisive moment' to describe that split-second when all the elements of a story come together within the viewfinder. We have plenty of examples of his skill at capturing that meaningful but fleeting occurrence, but we rarely hear about the shots he missed. A man who had a camera with him all the time, there must have been plenty of images on his contact sheets in which he had shot just a fraction of a second too soon or too late, and the elusive moment had slipped between the frames to escape and never be seen again.

I've always thought there are two principal skills to capturing a decisive moment – identifying that a decisive moment is about to occur, and actually pressing the shutter release as the moment comes together. Cartier-Bresson was clearly pretty good at both, but I'm certain that if he had been in a position to use Panasonic's 4K Photo mode his

hit-rate would have been astonishing. Recording at 30 frames per second 4K Photo simply makes sure every moment is captured, so all you need to do is recognise the best frame from the sequence and extract it using the back screen of the camera.

But where is the skill/fun in that, and isn't that cheating? If you use 4K Photo mode to capture images that you could have caught using your sense of timing and single shot mode, then yes that might be considered lazy. In street photography some situations develop too suddenly and without enough warning for even the most skilled photographer to be able to shoot the perfect frame.

There are times that the only way we can see something clearly is by replaying a second of memory – our eyes see the world in video mode, and our memory allows that video to be played back so we can examine events that just happened. And that is how Panasonic's 4K Photo mode works. I sense that something is about to happen, I set myself up, arrange

Baker Street series. I wanted to silhouette these rushing commuters, and using Panasonic's 4K Photo mode allowed me to capture a bumper crop of frames so I could pick the ones that worked best

the frame where I think it is going to happen and press record until the event takes place. It could be someone walking around a corner, someone stepping into a tiny patch of light, a silhouette walking in to a thin bright space or the coming together of two or more moving elements that can't be seen beforehand.

These events I know are going to happen and I can get in a position to capture them, but it is impossible to predict the exact moment things will come together, and once they do and I've seen it the moment has passed. With 4K Photo those moments never have to slip through my fingers, and I can tackle shots that previously

“For me though the ability to record a sequence of 8-million-pixel images at such a rate has allowed me to capture moments that previously I would never have been able to record”



I would have just filled a card with rubbish trying to get right.

No software required

It has been possible to extract stills from video for some time, but with normal HD video the pictures are very small and you need to understand movie software to be able to do it. With 4K Photo the individual frames have 8 million pixels and at print to 11 x 8in even with strict 300ppi photo-quality resolution. And you don't even need to download the movie to extract the stills, as it is all done in-camera. You can use Adobe Lightroom now to play the sequences and pull-out frames, but it is actually far easier to do it on the back of the camera. You play the movie and use stop/start buttons to control the flow. When you find the moment you want you can scroll through frame by frame, forward or reverse, to make sure you have precisely the best frame in which everything comes together.

Going to work – Baker Street series

I shot these images outside a train station during the rush hour one morning in the summer. The sky was a fabulous blue and I noted that when I crouched down in a shop doorway I could silhouette the rushing commuters against that inky background, using just their shapes to describe their visual identities.

I find you can read a lot about a person from their silhouette, and I love how that level of information contradicts the graphic minimalist mystery of the blacked-out shapes. As the people are extremely underexposed we should be able to learn nothing, but what the shapes and outlines reveal is often surprising.

On this occasion I wanted to combine the black silhouettes of the people coming towards me with the lit-up details revealed where the sun caught the people walking by in the other direction. I could see these interactions with my eyes as they happened, but as everyone was moving so quickly, and appearing without warning around a corner, there was no way I would have been able to record those moments in single frame shooting mode. Instead, I positioned myself and the camera to create a frame with the canopy of the station and allowed room for the people to move into where I knew the sun was catching the faces going from right to left. When a train arrived



a rush ensued, and I recorded the activity that passed through the frame. I was looking for interesting hairstyles, hats, bulky headphones, bags and all the other accessories that humans use that make their shapes interesting and revealing.

As I was filming I could see moments happening, and made mental notes to go back to find them afterwards. I shot about six clips of between 10 and 30 seconds on this occasion, and harvested a bumper crop of frames that just worked.

While I had a good idea of what I wanted from the session I also like the element of surprise that comes when I find images that I couldn't even have wished for. They are all variations on the original concept, but as I had no control over who would walk into the frame and where, or how they would be positioned, the final element in the picture, as with nearly all photography, is luck. And the 4K Photo mode allows me to make the most of that luck and to reap the benefits of my original idea – I rarely have to come home without the shot that I was looking for. In fact, without 4K Photo I probably wouldn't have attempted the shot. The new modes allow me to take pictures that I wouldn't otherwise be able to consider. What is remarkable is the shortness of the magic moment. Even at 30 frames per second the subjects are in the right places in only one frame – the frames before and after are completely different, and have none of the magic of the decisive frame.

All the pictures on these two pages were shot with Panasonic's new 20MP Lumix GX8 Compact System Camera

Cameras with 4K Photo mode

Panasonic's new 20MP Lumix GX8 isn't the only Lumix with this feature. The Lumix GH4 also has 4K Photo mode, as does the new Lumix G7. For those who like smaller models try the Lumix LX100 premium compact camera or the Lumix CM1 connected camera with its 1-inch 20MP sensor.

To find out which model suits you, visit your local retailer or look out for Panasonic Lumix events where you can try one for free. Alternatively, visit panasonic.co.uk/lumix4k



Panasonic LUMIX

GX8 KEY FEATURES

- 20MP resolution
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- Excellent handling thanks to dial controls and sizeable grip
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Shoot action with your **Canon DSLR**

There's more to action photography than a fast shutter speed. Here's our guide to freezing movement

WORDS **TOM CALDW**
PICTURES **MICHAEL TOPHAM**



There's something almost magical about action photography. The ability to stop lightning-fast subjects dead in their tracks with a single press of the shutter button is bound to open up a whole new world of intrigue and excitement for any keen photographer. Besides having a bit of patience and spot of good timing, there are a few other skills you'll need to master first before you can really start to capture award-winning shots, so this month we're going to show you everything you need to know to get started with action photography.

If you're serious about getting into action photography, then the first step is to ensure that you have the right gear for the job. Ideally you'll need a camera that offers a high frames-per-second (fps) burst-shooting mode – the entry-level EOS 750D and EOS 760D offer 5fps, which is a

A camera that offers a high frames-per-second burst-shooting mode is desirable for action photography

good starting point, while the more advanced EOS 7D Mark II shoots at 10fps. Obviously the faster the fps, the quicker you can fire off a round of shots, which will maximise your chances of bagging a great image.

A good autofocus system is also vital, as a slow or unresponsive AF will not be able to keep up with your fast-moving subjects. Traditionally, phase-detection AF, which is found within all EOS DSLRs, was widely considered to be quicker and more accurate than contrast-detection AF that's commonly adopted by compacts and Compact System Cameras (CSCs) such as the EOS M3. The gap has closed considerably

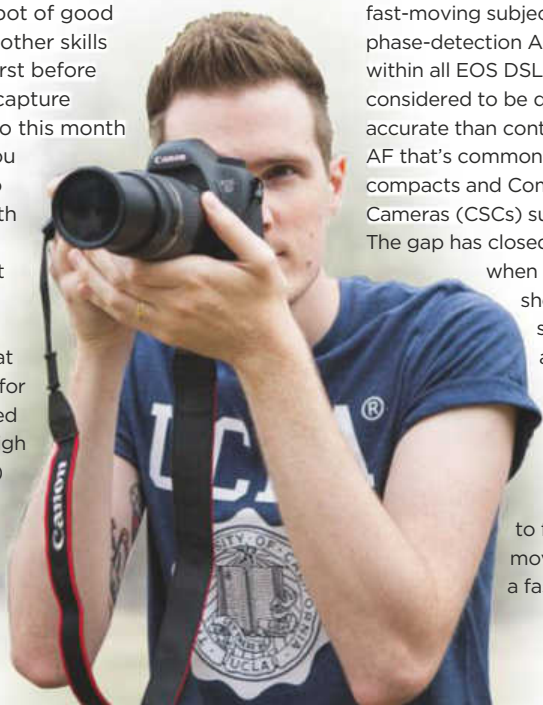
when it comes to shooting static subjects, but SLRs are still usually better at continuous AF with moving subjects.

When it comes to freezing fast movements, using a fast shutter speed

is the key – remember, fast shutter speeds will freeze movement, while slow shutter speeds will blur movement. But how fast is fast enough? Well, the answer to that really depends on how fast your subject is moving. The faster the subject is moving, the faster the shutter speed needed in order to completely freeze the movement. For example, when photographing a running athlete, a shutter speed of around 1/250sec would be enough to freeze the movement, while a sports car moving at speed would require a shutter speed of around 1/500sec.

Exposure

The thing to remember when using fast shutter speeds is that the sensor is only exposed to light for a very short amount of time, and if there's not enough available light then this may cause your shots to become underexposed. To counteract this you can, of course, increase the camera's ISO sensitivity to make it more sensitive to light, though this comes at the price of increased noise on your images. Alternatively, you



could always try using a lens that has a large maximum aperture, which will in turn allow more light to enter the camera, though these lenses can often be expensive, especially for telephoto zooms such as the EF 70-200mm f/2.8L IS II USM.

Speaking of lenses, the glass you attach to your camera will also play a vital role in the resulting quality of your images. Typically when shooting fast-moving subjects, such as sports or wildlife, you're going to be a fair distance away from the action, so investing in a telephoto lens is a great idea. The basic EF-S 55-250mm f/4-5.6 IS STM lens will set you back about £200 and is a sound choice if you're just getting started with action photography, though as time progresses you may find that you'll want to invest in a lens that offers more advanced features such as a wider maximum aperture and a fast ultrasonic-type focus motor, such as the £800 EF 70-200mm f/4L IS USM.

Before you're ready to start taking shots, the first thing you want to ensure is that your camera's autofocus system has been correctly set up to deal with the situation, as this will greatly improve your chances of capturing sharp shots. To start with, set your camera's focus mode to AI Focus, which will cause your camera to continuously seek out a target as long as you keep the shutter button either half or fully depressed. This is good for moving targets as it'll allow the AF to keep adjusting itself as the subject moves across the frame and maintain a sharp focus. It's also

SHOOTING ACTION VIDEO

To capture action video, switch your camera to Shutter Priority mode (Tv on the mode dial), then activate the Video Record mode. In this mode, the camera will control the aperture, so all you have to worry about is the shutter speed. As with stills, a faster shutter speed reduces blur caused by moving subjects, so set it to 1/100sec or higher. Using faster shutter speeds will create a kind of jittery effect to your footage, which is a trick often used in action movies to create a fast-paced effect.

AI Focus adjusts itself as your subject moves across the frame, allowing you to capture the image at just the right moment



“Before you start, the first thing you’ll want to ensure is that your camera’s autofocus system has been correctly set up”

a good idea to switch your camera over to Continuous shooting mode, which will allow you to hold down the shutter button and capture a continued stream of images.

Raw or JPEG?

It's also worth considering whether you should shoot in Raw or JPEG. Although Raw gives you much more control over your images in post-production, they are also much larger in terms of file size, which will quickly fill the camera's buffer when taking multiple images in quick succession. JPEG images are much smaller in file size, which means that you'll be able to take more shots in quick

succession before you're forced to stop to refresh the buffer.

The good thing about photographing most fast-moving objects is that it's often easy to predict their movements and prepare yourself in advance. For example, if you were shooting a sports car on a racetrack, you can position yourself on a specific part of the track, frame up the shot and then simply wait for the car to pass in to the frame. This predictability means that you can also use a technique called pre-focusing, which consists of focusing on an object within the frame that is roughly the same distance away as where the subject will appear as it comes in to

Step by step

How to set up your Canon DSLR for successful action shots

STEP 1



SHUTTER PRIORITY

Switch your camera to Shutter Priority mode (Tv on the mode dial) as this will allow you to set the shutter speed while the camera takes care of the aperture. Next, dial in a suitable shutter speed for the subject – if you're unsure, start at 1/250sec and if there's blur in your shots, increase it incrementally.

STEP 2



ADJUST THE ISO

If you're using a really fast shutter speed and there's not an abundance of available light, you may find you have to increase the camera's ISO setting in order to make it more sensitive to light. Alternatively, you can always set the ISO setting to Auto mode to allow the camera to increase and decrease this setting for you.

Memory cards

A piece of essential gear that is often neglected is the humble memory card. When you need to write a lot of data to a memory card as quickly as possible, as is the case with action photography, then investing in a quality memory card is an absolute must. The card's maximum capacity is obviously an important aspect, as

the more space that is available on the card, the more images you can write to it before it needs to be swapped out for a fresh one. However, arguably more important than that is the card's write speed. The write speed determines how



fast images taken by the camera are able to write on to the memory card – the faster the card's write speed, the quicker the camera buffer will be able to empty and as a result the more photos you'll be able to take in quick succession.

A certain amount of blur can be desirable, as it conveys a sense of movement. Panning helps keep the important parts of the image sharp



frame. By setting the focus beforehand it reduces the amount of time the AF has to take to lock on to the subject as it appears, and means that you can start shooting without any hesitation from the AF.

It goes without saying that in order to keep your subject in focus, you're going to have to track it as it moves while keeping the active AF point hovered over it. This can sometimes be easier said than done, so if you find yourself struggling to keep up, try switching your camera's AF point selection to Automatic. When set to automatic, the camera will decide for you which AF point, or group of AF points, needs to be active in order to keep up with the subject. Top-end models like the EOS 7D Mark II will even offer advanced AF-tracking modes that can be programmed in order to better predict how different subjects will move around the frame.

Panning is a technique that every aspiring action photographer will need to master, in order to successfully track moving subjects. Ensuring that your pan is smooth and constant may take a bit of practice but it'll really help to prevent wonky or poorly composed shots. To make things a bit easier you can always try perching your elbows on a stable surface, like a nearby fence, in order to give yourself more stability while panning. Failing that, investing in a monopod and attaching it to the base of your camera (or even to your lens's collar if it has an attachment) will also add some support to your camera as well as providing a pivot point for a much smoother panning action.

STEP 3



CONTINUOUS DRIVE MODE

Locate the camera's Drive mode settings (usually a dedicated button on the camera body) and then switch it to High Speed Continuous. With this mode set you'll be able to hold down the shutter button and rattle off a continuous stream of shots to give yourself a much better chance of capturing the action.

STEP 4



SET AF MODE

Next, find the camera's AF mode settings and switch it over to Continuous mode (this can often be listed as AF-C or AI-Servo mode on some cameras). With this mode activated, the camera will continuously adjust the focus while the shutter button is held down, which is ideal for moving targets.

STEP 5



ADJUST THE ACTIVE AF POINT

Finally, set the active AF point mode to Automatic as this will allow the camera to automatically adjust which AF point, or group of points, are active, to give it a better chance of tracking the subject as it moves across the frame. If your camera has a subject tracking feature, also enable this through the settings menu.



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Dealing with sensor dust

Nikon cameras have some useful tricks to stop dust on the sensor from ruining your images. Mark Higgins explains it all

WORDS AND PICTURES MARK HIGGINS



Dust on the sensor. Those are the words that photographers never want to hear. Keeping your sensor clean is always a concern, but lenses need to be changed and mistakes do happen. Sometimes, little particles can creep into the places where you don't want them.

You'll find yourself noticing sensor dust most if you're a landscape photographer. Images with lots of negative space – big blue skies or sweeping seas – will show dust spots most readily, as will images with a large depth of field. This isn't to say that other kinds of photographers are off the hook, though – street photographers who use negative space don't want dust interfering with their images, and if a portrait photographer gets a spot of dust on the wrong place – an eye, for example – it could ruin a great shot.

Nikon has included a function on its

Photographs that feature large expanses of sky are particularly prone to showing up any errant dust particles

“Keeping your sensor clean is always a concern, but lenses need to be changed”

DSLRs to combat the encroachment of dust on sensors, which is called Dust Off Ref. In this article, I'll be explaining how Dust Off Ref works and how to use it, as well as giving you some general tips on best practice for keeping your sensor clean so that hopefully you don't need it too often.

What is Dust Off Ref?

Put simply, Dust Off Ref takes a reference image on your camera designed to record the location of any sensor dust, which can then be used in software to clean up batches of images that have been affected by it.

It's something that, if you can get into the habit, is worth incorporating into your workflow. It's easy to do, as we'll see in just a moment, and means that you'll always be able to

compensate for any dust that gets onto your sensor. Another reason for this is that Dust Off Ref images tend to only be really useful with images taken immediately before or after them, as dust can move around inside the camera. A Dust Off Ref image taken six months ago won't be much good for dealing with dust on images you take tomorrow! The Dust Off Ref files – 'NDF' files – don't take up any more room on your card than a regular Raw or JPEG file, so there's no downside to taking them regularly.

Shooting a Dust-off Ref Image

This is the only bit of the process that I think is a little finicky – once you've done it, applying Dust Off Ref is pretty straightforward.

Go to the 'Setup' menu in the camera, then select 'Image Dust Off Ref photo'. From there you simply select 'Start' – the camera will instruct you to take a photo of a bright, featureless white object from a distance of about 10 centimetres, with focus on your lens set to infinity. A sheet of white A4 paper will work, as will a grey card.

Once you're set up, simply take the photo. The camera will reject it if it's not right for any reason, much

like if you take a white balance reference photo, but it should be fairly straightforward to get the exposure right.

One thing to note – in a lot of newer cameras you'll see two options before you take the image – one to start, and one to clean the sensor and then start. This vibrates the low-pass filter to clean the sensor, in the way many cameras will when you turn them off. I would actually recommend not doing this – I'm not entirely sure

why it's an option, as it will remove the dust that you're trying to record for reference!

When you've done it correctly, you'll see a checkerboard image on the back of your camera. This represents the NDF file, which is Nikon's nomenclature for a Dust Off Ref file. If you've taken it at the same time as the files you want to apply it to then that's more to the good, as the next step is applying the correction in software.

Keeping the sensor clean

Keeping your sensor clean is very important, but it comes with one caveat: it's probably not worth trying to clean it yourself. If you scratch it you could face a hefty bill – a D4 owner might expect to pay around £1,200, as the repair people would have to replace the whole sensor unit and put the camera back together from scratch.

It is perfectly possible to clean your own sensor, but unless you truly know what you're doing, it is absolutely not recommended. Instead send it off to be professionally serviced – Nikon will do it for about £25, and Calumet will do it for a little more than that.

I speak from experience – a long time ago, the sensor of my first DSLR, a Nikon D70, ended up acquiring some dust. I attempted to clean it myself, and ended up making the situation much, much worse. I had to send the camera in for repair, and if I'd just gone for a professional clean in the first place it would have been a lot cheaper.

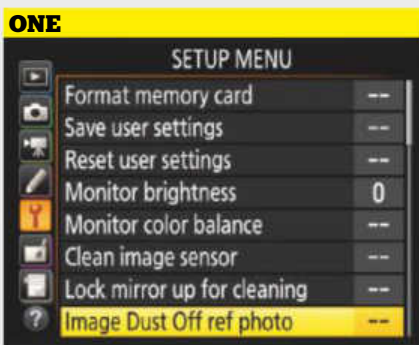
With that said, there are a few things you can do to prevent dust getting on your sensor in the first place.

HERE ARE MY TOP TIPS

- 1 Turn your camera off while changing the lens.
- 2 Regularly vacuum your camera bag to reduce dust.
- 3 Double-sided tape on the inside of the lens and body caps will catch any dust. Replace the tape from time to time if you think it is too dusty.
- 4 Point your camera down towards the floor while changing lenses.
- 5 Keep a rocket blower in your bag to blow away any unwanted dust particles.



How to set up your Nikon DSLR to use Image Dust Off ref



SELECT IN THE SETUP MENU

Navigate to the setup menu in your Nikon camera and you'll find the option to set the camera up to take a Dust Off Ref photo. It's a good habit to get into at the start of every shoot, even if you don't end up using it.



START

You'll see two options: to start straight away or to clean the sensor by vibrating the low-pass filter and then start. If you're taking the image in advance then clean the sensor, but otherwise skip this option.



Using Capture NX-D

You may not have used Nikon's Capture NX-D software before, but as it's completely free to download, it's easy to incorporate it into your workflow, even if you're a dedicated Photoshop or Lightroom user.

The software will do all the hard work in applying your NDF Dust Off Ref to your images – you just need to make sure that they're in the same folder. Simply select the option to apply the Dust Off Ref in the toolbar to the right, as shown in the screencap. This will batch-apply the corrections from the NDF file to all the images in the folder.

Once you've done that, you're done! Dust Off Ref is something that you should hopefully not have to rely on (see box on page 24 for some sensor maintenance tips), but it's a great get-out-of-jail-free card for times when accidents happen.



THREE



SHOOTING INSTRUCTIONS

You'll now see instructions for how to take the reference photo. A white piece of paper would do nicely, or a plain white wall. You'll know if the photo isn't right because the camera will tell you.

FOUR



INDICATION OF A SUCCESSFUL REFERENCE IMAGE

Once you've successfully taken a reference image you'll see this checkerboard pattern on your LCD screen. This is the visual representation of the NDF file which the NX software will use for reference.

FIVE



HOW THE NDF FILE WILL APPEAR

The file will look like this in among your regular image files. As long as you keep it in the same collection or folder as the images you want to apply it to, then the software will be able to do the work for you. Easy!

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Using Live Bulb for long exposures

The popularity of long-exposure photography shows no sign of abating. The Live Bulb function on Olympus cameras helps to take any guesswork out of the process. Here's how to use it

WORDS AND PICTURES **STEVE COOLING**

Long-exposure images have become very popular in recent years, particularly in the field of landscape photography. Static elements (trees, buildings, fence posts and rocks, for example) contrasted against moving features such as water or windblown clouds and foliage during an exposure of several seconds can create ethereal, moody images. They can transform a relatively mundane scene into an evocative photograph.

However, there is a danger that long-exposure photography is becoming a cliché – technique for technique's sake; a reflection of current fashions or the photographer's obsessions, not something chosen to reinforce the message they want to

A long exposure captures movement in the clouds but most importantly smoothes the water, accentuating the texture of the foreground rocks. Olympus OMD E-M5 II, 12mm, 53.8 seconds @ f/8, Big Stopper

convey about their subject. This is true of any technique that's used blindly, without thought given to its appropriateness to the subject.

Using a technique with a specific aim in mind is the key to success. For example, using a long exposure to accentuate contrasting textures – the rough texture of stones, rocks or wood (jetties, fallen trees) against the smoothness of blurred water – or to create a sense of energy and dynamism in an image. The landscape is rarely static – it constantly changes over seconds, minutes, weeks or years, and a long exposure can convey that sense of restlessness by capturing movement in one frame.

Subtlety is also important. Not every image requires an exposure of

several minutes – sometimes an exposure of a few seconds can convey a sense of movement more effectively. This is particularly true of waterfalls, for example – a very long exposure will turn the water into a substance resembling cotton wool, whereas a shorter one gives a sense of movement but also retains the texture of flowing water.

One of the attractions of long-exposure photography is that the resulting images record a dimension of the world we can't see with the human eye. Our brain takes a snapshot of what we see and is not capable of recording a scene as it evolves over seconds or minutes. These images are difficult to pre-visualise; it's hard to predict

exactly what the camera can see. This can be one of the great attractions – it adds an element of luck or chance to the final image. For example, windblown clouds can provide unpredictable shapes or patterns in the sky to enhance the mood of the finished photograph.

But this uncertainty can also prove incredibly frustrating. Particularly when it comes to exposure. Taking a four-minute exposure at dusk (when there's usually little chance to repeat the shot) only to discover that a six-minute one was required can be exasperating to say the least.

Not any more, though, thanks to a unique feature introduced by Olympus to its OMD range of cameras – Live Bulb and Live Time.

What is Live Bulb/Live Time?

This feature gives a regular update on the exposure as it is progressing, while the shutter is open. So the photographer is able to see the image 'develop' in-camera and stop the exposure once the shutter has been open for sufficient time to give a correctly exposed photograph (see Step by Step guide).

The interval of the update can be set from 0.5 seconds to 60 seconds with the timing set by the photographer depending on the total length of exposure. So, for example, with an exposure of eight seconds you might require an update every two seconds, whereas with an exposure of two minutes a 30-second update may be more appropriate.

In Live Bulb mode, the shutter remains open for as long as the shutter is depressed. In Live Time

My week on the Faroe Islands was characterised by changeable weather – a feature implied in the dynamism of the windblown clouds.
Olympus OM-D E-M1, 12-40mm,
61.7 seconds @ f/16, Big Stopper



Metering for long exposures

Other cameras may not benefit from the Olympus Live Bulb/Live Time feature, but of course long exposures are still possible. If you're shooting with an ND filter fitted, then meter before adding the filter. Lee Filters provides a useful conversion table with its 6 and 10-stop filters to calculate exposure with the filter in place. Alternatively, there are apps that do the maths for you (see opposite page).

If you're taking a photograph in naturally dark conditions, then increase the ISO setting of your camera to get an exposure reading and use this to calculate the required exposure at your chosen ISO for taking the shot.

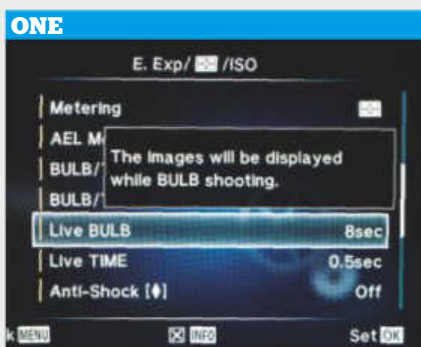
mode, the shutter release has to be pressed once to open the shutter and then pressed again to close it.

Live Bulb/Live Time appeared on the first OM-D – the E-M5. However, this gave only an updated view of the image. On subsequent OM-Ds (the E-M1, the E-M10 and most recently the E-M5 II), the histogram was added. This useful addition is far more reliable than trusting only the image view on the camera's rear display panel (the panel will view differently depending on the lighting conditions, and the brightness of the screen also influences how the image appears).

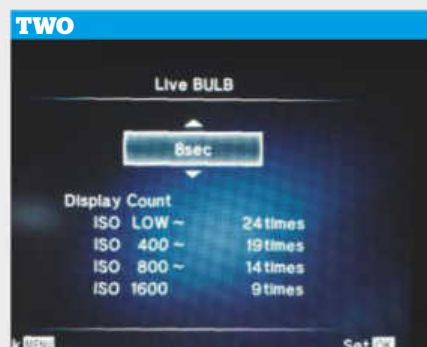
With the E-M10, Olympus also introduced Live Composite Mode (subsequently added to the E-M1 and

Step by step

How to take creative long exposures with the Live Bulb feature



Select the Live Bulb function in the Menu (Menu> Custom Function E>Live Bulb).



Select the Live Bulb interval required for the particular exposure. In this case the interval has been set to 8 seconds. Next, turn the Exposure Mode dial to M for Manual.

included with the E-M5 II at launch). Live Composite mode also takes long exposures, but several of them, and only adds new light sources to the final picture. It's great for capturing star trails or firework displays.

Image noise is always an issue with long exposures – the longer the shutter remains open, the hotter the sensor gets and the more digital noise becomes apparent. To get the best image quality, it is important to use a low ISO setting and to turn on the Long Exposure Noise Reduction feature. This will double the exposure time, but leads to higher-quality files.

It's worth noting that long exposure noise is more of a problem with the Olympus OM-D E-M1 than the other cameras in the range. This is the price paid for its more sophisticated autofocus system.

Reading the histogram

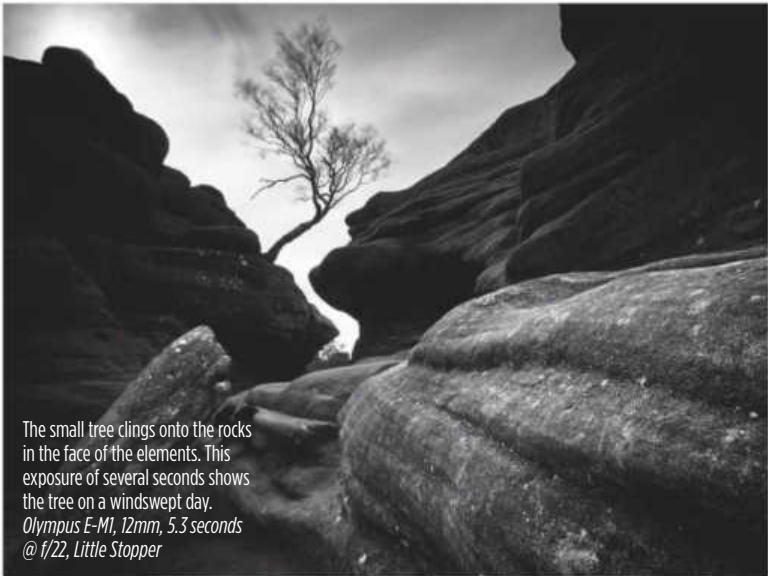
To make the most of the Live Bulb feature, it's important to understand the histogram – what it is and how you use it to best effect.

Most simply, the histogram shows the distribution of tones in an image from pure black (on the left-hand of the display) through shades of grey to

USEFUL APPS

Smartphones and their apps are almost an essential photographic accessory these days. Try these: **Pocket Light Meter** Gives spotmeter readings as wide as f/1 and with ISOs as high as 102,400.

Longtime Exposure Calculator Saves you doing the maths when using ND filters. **Olympus Viewer** Allows the photographer to operate Live Time remotely.



The small tree clings onto the rocks in the face of the elements. This exposure of several seconds shows the tree on a windswept day. Olympus E-M1, 12mm, 5.3 seconds @ f/22, Little Stopper

pure white (on the right-hand side of the display). If possible, it is important to adjust the exposure to avoid the loss (or 'clipping') of both highlight and shadow detail – that is, to make sure that the distribution is not so far over to the right or left that information is lost.

If you're shooting Raw files (as opposed to JPEGs) it is also important to remember to 'expose to the right' – that is, to bias the exposure towards the highlight end of the display *without* losing detail in the highlights. This will give the best-quality information to work with when processing the image.

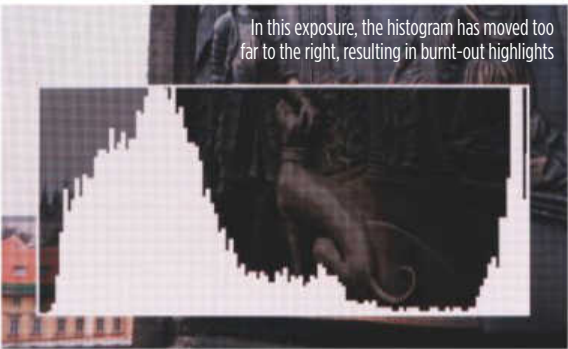
So in practice, when using the Live Bulb/Live Time features of the Olympus cameras, keep the shutter open until the histogram display moves across to the right hand side and close the shutter just before highlight details are lost.

Other essentials

Successful long-exposure photography (with the Olympus range or any other camera) requires good technique and some additional bits of kit.

A good quality tripod and head are a must. Even the smallest and lightest of cameras will need to be mounted on a solid support. A cable release will allow for the shutter to be fired without touching the camera and thereby avoid the risk of causing camera movement. And if your camera has a mirror then use mirror lock-up to prevent any possible vibration caused as it moves out of the way at the start of the exposure.

Finally, if you want to take long exposures in brighter conditions then a neutral-density (ND) filter will be required. Lee Filters (among others) makes varying density (2, 3, 6 and 10 stop) filters for this purpose.



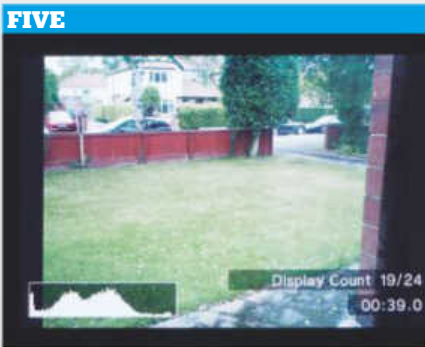
In this exposure, the histogram has moved too far to the right, resulting in burnt-out highlights



Adjust the shutter speed beyond the longest timed setting, i.e. 60 seconds, and the Live Bulb setting will be found.



Open the shutter using a cable release. The Olympus release has a lock setting which is useful for very long exposures.



Watch the histogram move to the right as the exposure 'develops' and end the exposure before highlight details are lost, i.e. before the histogram moves off the right-hand edge of the display.

Out of the water they resemble beached torpedoes; below the water's surface, seals are the sleek ballerinas of the seas. In Britain, our two breeding species – the harbour or common seal and the grey seal – are popular subjects with photographers.

In summer, harbour seals come to shore to pup, usually from June. The adults then remain on the beach to moult, with good numbers remaining ashore, often until mid-September.

Grey seals pup a little later, in autumn. In Cornwall, seal births start in August, and as you move clockwise around the coast of the British Isles, pupping periods become progressively later. In Lincolnshire and Norfolk, where big grey seal colonies live, pupping happens from November through to mid-December.

Grey seal pups are engaging subjects with their big doleful eyes and white coats. The white 'baby' phase lasts just a few days until the seals start to moult and the mottled-grey adult coat begins to show. This starts around the face until by around their third or fourth week, the pups are starting to resemble adults in colour.

Mating game

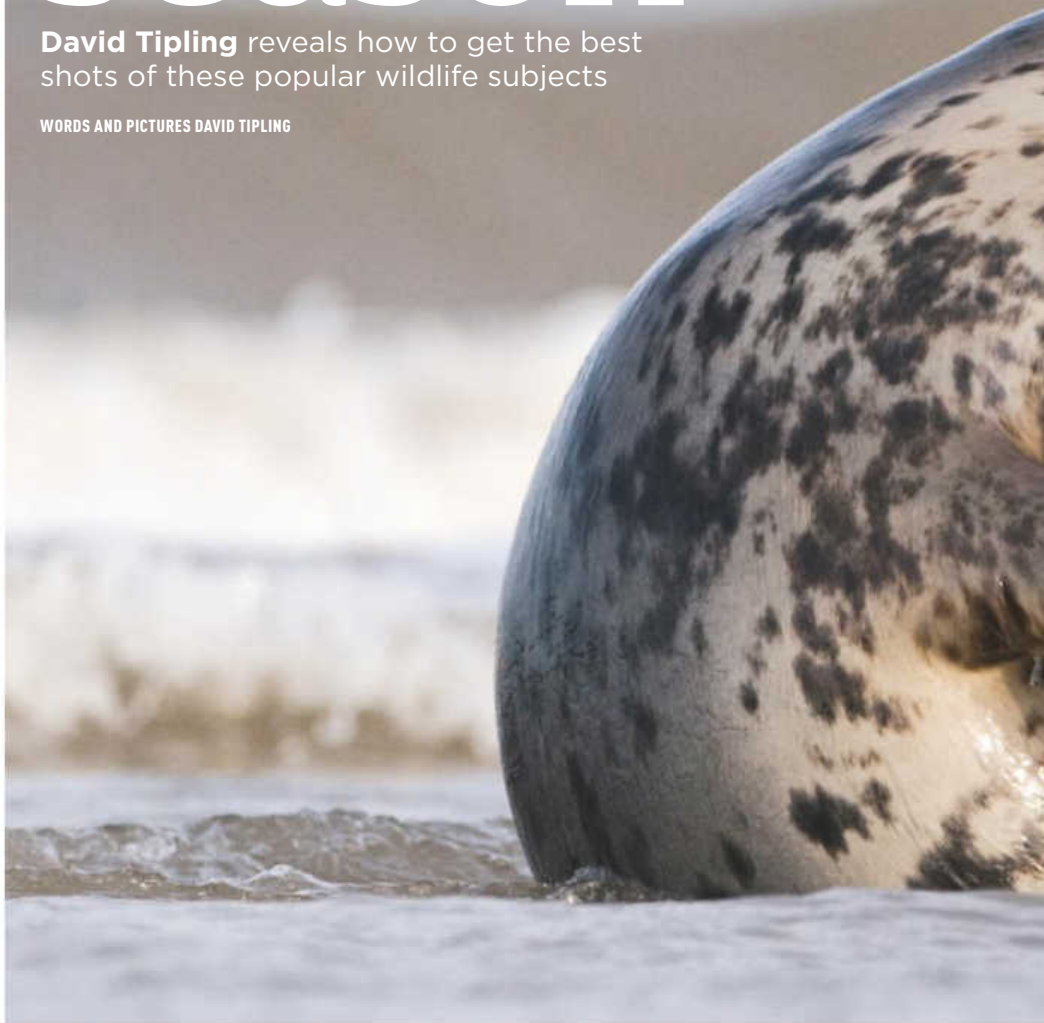
The most dramatic photographic opportunities often come at the start of the mating season. Initially, the big bulls protect their females and cubs within a harem. This harem is important to the male as once the pups are weaned, females are then ready to mate. Mating can start in October in some parts of the country, continuing into late January at some east-coast colonies. I like to try to find animals that are mating in the breaking surf as there is often a lot of aggression involved, which can lead to some dynamic pictures. Fights among bulls can be violent, with spectacular photography on offer as waves crash over the animals, though there are plenty of intimate moments to capture as well.

When photographing seals, I try to shoot as low as possible, because a more intimate feel to the subject can be created when on their level. This can be achieved using a beanbag, or a tripod that allows its legs to be splayed outwards. You can, of course, be inventive and find something washed up along the shore to rest your camera on. When shooting low to the ground, there are two things

Seal season

David Tipling reveals how to get the best shots of these popular wildlife subjects

WORDS AND PICTURES DAVID TIPLING



Breeding grey seals can make for dramatic subject matter



You'll need a long lens for some shots out at sea



KIT LIST



Telephoto lens

If photographing breeding seals, use a telephoto lens upwards of 300mm for intimate shots without risk of disturbance. It'll also help isolate the seal, avoiding cluttered backgrounds.



Beanbag or tripod

When shooting low shots, to avoid getting your camera and lens covered in sand, mount it on a tripod that has splayed legs, or use a beanbag for a flexible and quick-to-use support.

Angled viewfinder

If you haven't got a flip-out screen, you can attach an angled viewfinder to many camera bodies. These really help when shooting low to the ground – they save strain on your neck and help to avoid wonky horizons.



Telephoto zoom lens

A long telephoto zoom lens in the region of 80–400mm is ideal for seal photography. This is especially true when viewing them from a boat where there is little control as to how close or far from your subject you will be.



A seal pops its head out of the surf on the north Norfolk coast



to watch out for that can ruin a shot: wonky horizons are a curse, while you should also check your backgrounds for unsightly out-of-focus seals that might be rendered as dark blobs.

I tend to wear chest waders or an overall. The waders stop your knees and thighs from becoming soaked, which, on a cold day on the east coast, ensures you are likely to stay

out shooting longer before running for home to warm up.

Right conditions

On a dull day, the North Sea can look grey and quite uninviting, so if you're shooting animals in the surf or when they're poking their heads above the waves, then I often find that a blue sky is best. That said, duller days are more suited to capturing those cute

white pups, which are born below the high-water mark on intertidal rocks and sandbanks.

Visiting colonies on sandy beaches in really wild weather can offer dramatic photographic opportunities as well. Although your gear might take a hammering if unprotected, there are opportunities to create images of seals lying in a blizzard of blowing sand. When coupled with

Don't always go for the obvious shots





AF-S Nikkor 24-70mm F2.8E ED VR

NEW

Quick specs

Focal length 24-70 mm
Image stab. Yes (4 stops)
Lens mount Nikon F (FX)
Max aperture F2.8
Min aperture F22.0
Min focus 0.38 m (14.96)
Max magnification 0.27x
Weight 1070 g (2.36 lb)



AF-S Nikkor 24mm F1.8G ED

NEW

Quick specs

Lens type Prime lens
Image stab. No
Lens mount Nikon F (FX)
Max aperture F1.8
Min aperture F16.0
Min focus 0.23 m (9.06)
Max magnification 0.2x
Weight 355 g (0.78 lb)



AF-S Nikkor 200-500mm F5.6E ED VR

NEW

Quick specs

Lens type Zoom lens
Focal length 200-500 mm
Image stab. Yes (4.5 stops)
Lens mount Nikon F (FX)
Max aperture F5.6
Min aperture F32.0
Min focus 2.20 m (86.61)
Max magnification 0.22x
Weight 2300 g (5.07 lb)



AF-S 300mm F4E PF ED VR

NEW

Quick specs

Lens type Prime lens
Focal length 300 mm
Image stab. Yes (4.5 stops)
Lens mount Nikon F (FX)
Max aperture F4.0
Min aperture F32.0
Min focus 1.40 m (55.12)
Weight 755 g (1.66 lb)



D810

Quick specs

Sensor size Full frame
Sensor type CMOS 36MP
ISO Auto, 64-12800
Lens mount Nikon F
Screen size 3.2
Screen dots 1,229,000
Min shutter speed 30 sec
Max shutter speed 1/8000 sec
Weight 980 g



D750

Quick specs

Sensor size Full frame
Sensor type CMOS 24MP
ISO Auto, 100-12800
Focal length mult. 1x
Screen size 3.2
Min shutter speed 30 sec
Max shutter speed 1/4000 sec
Weight 750 g



D5500

Quick specs

Sensor size APS-C
Sensor type CMOS 24MP
Lens mount Nikon F
Articulated LCD Fully articulated
Max shutter speed 1/4000 sec
Storage types SD/SDHC/SDXC



D3300

Quick specs

Sensor size APS-C
Sensor type CMOS 24MP
Lens mount Nikon F
Articulated LCD Fixed
Max shutter speed 1/4000 sec
Storage types SD/SDHC/SDXC



Don't be put off by windy conditions, as these can be quite dramatic



low autumn sun, this can achieve an especially dramatic effect.

Harbour seals offer more of a challenge for photography in Britain and are often more timid, so a more careful approach may be required. They can be found on rocks or sandbars at many coastal localities. Outside the breeding season, both species can be encountered on boat trips that run to seal colonies (see Blakeney Point and Farne Islands in the site guide on page 41). Boats can often get in very close to resting seals, while animals in the water are usually quite curious and readily approach boats. In such situations, a telephoto zoom is often the best option.

TOP TIPS



Shoot low

Shooting low is my top tip for giving your images impact. Shooting from above, looking down, will create a more detached feel to the seals. Just don't lie close to breaking waves, as you may get wet and your gear too!



Depth of field

Play around with depth of field but check the eyes are in focus. Focusing on the tip of the nose will result in eyes that are not sharp. If shooting mother and pup, enough depth of field is essential to get features in focus.

Location guide

There are many great locations for photographing seals in the UK, but I've selected these three sites for their ease of access.

Do respect requests to stay out of pupping areas or off beaches. Seals on a beach can easily be unsettled by photographers approaching too closely. If a seal starts to look up anxiously and move, then you are too close. By standing back and using a longer lens, you'll find that natural behaviour can be captured, including fights among bulls and tender moments between mother and pup. In short, move low and slow. The seals are not going to rush off anywhere, so taking time to get into an optimum position will pay dividends.



adults fighting and mating in the surf.

Donna Nook is best visited in the week to avoid the crowds during the pupping season. If walking out to the sea in late winter, then access is allowed only at weekends, as these sand flats are used as a bombing range during the week. A well-known photographer once needed a change of underwear after ignoring the red flags and causing a bombing run to be aborted! Visit www.lincstrust.org.uk/donna-nook for more details.

2 Blakeney Point, Norfolk

Another large colony that's warded during the pupping season. Common seals can be seen here in summer and by mid-autumn the beach becomes crowded with grey seals. The rookery is roped off and by far the best way to photograph the colony is by boat. Seal trips run daily on high tides. Visit www.bishopsboats.com or www.sealtrips.co.uk and www.nationaltrust.org.uk/blakeney for further details.

1 Donna Nook, Lincolnshire

This east-coast site is renowned for its large grey seal colony and is probably the best location in Britain for shooting this species. But, be warned, it is very popular both with photographers and the public, as a warded pupping area in the dunes allows very close views of adults and young. Access to the sandbanks is discouraged during the breeding season, but by late December and by walking out to the sea, great opportunities can be enjoyed photographing

3 Farne Islands, Northumberland

Grey seals can be enjoyed from boat trips during summer. However, the trips are of short duration, as they are part of a longer tour visiting seabird colonies, and run in the middle of the day when light is at its harshest. The Farne Islands do, though, offer the best site in Britain to dive with grey seals, offering some outstanding underwater photography opportunities. Boats depart from Seahouses. Visit www.farne-islands.com for details.



Black & white

Seals on a beach or in the sea are not very colourful, so a picture may have more impact if converted to mono – especially if shooting into the light, where you have nice textures on wet sand or highlighted whiskers.



Bad weather

If the forecast looks bad, grab the opportunity. Seals in the surf in heavy seas or on a wind-blown beach can make far more dramatic pictures than shots taken on a perfect, still autumnal day, so embrace wild weather.



A wider view

Pack a wideangle lens for shooting the bigger picture. Whether a seal sprawled under a big sky or people viewing seals at a warded colony, there are plenty of opportunities for using shorter lenses to help tell a story.

The GX7 is one of the best CSCs Panasonic has ever produced

Panasonic Lumix GX7

WWW.PANASONIC.COM/UK/

When Compact System Cameras (CSCs) first hit the market, they were targeted at those wanting to make the step up from compact cameras without wanting the bulk of a DSLR. As a result, they were often considered lower in the pecking order than even entry-level DSLRs, and were overlooked by the more 'serious' photographers. As the sector developed, however, manufacturers started to realise that, in fact, more advanced photographers viewed smaller CSCs as an alternative lighter option to their larger DSLR kit.

Panasonic was one of the first manufacturers to cater to this market with the launch of the Lumix DMC-GF1, which was targeted at enthusiasts and professionals. This was followed by a host of similar models from competitors, heralding the growth of the sector, while on launch the GX7 was considered a further development of this idea and was labelled by Panasonic as its best CSC to date.

The GX7 features a newly designed sensor in comparison to its predecessor – the GX1. The chip is a 16MP Live MOS sensor which, when paired with the Venus Engine image processor, is capable of some excellent image quality and strong performance in low light. Several other features allude to its appeal towards the more advanced photographer. One such feature is the model's tilting viewfinder – while some



A very wide range of lenses is available for Panasonic CSCs



The EVF can be tilted, permitting viewing from a 90° angle

The pop-up flash expands the versatility of this camera

LAUNCH PRICE **£819** WITH 14-42MM LENS

CURRENT PRICE **£450** WITH 14-42MM LENS

competing models fail to offer a viewfinder, or only offer one as an external afterthought, the GX7 ships with a 2.7m-dot EVF that can be tilted about 90° to face directly upwards.

This is accompanied by a 3in, 1.04m-dot tiltable LCD with touch-sensitive technology.

Other impressive features include Panasonic's renowned light-speed AF set-up, while Full HD video capture is also offered in either AVCHD or MP4 formats, alongside both Wi-fi and NFC connectivity.

■ See our full review of the GX7's new sibling, the GX8, on pages 72 and 73.

What our test said

For a camera of this type, the Panasonic Lumix GX7's specification is very comprehensive. The plethora of programmable body-mounted controls is also welcome, and all adds to the excellent shooting experience offered by the GX7. It really is a very nice camera to shoot with, and special mention should go to the built-in EVF that delivers a more intuitive and natural way of working.

The GX7 is a very polished and well-made camera that not only delivers excellent results, but is a pleasure to use at the same time. Panasonic has made a bold statement saying that the GX7 is their best Lumix camera to date, and we have to say we fully agree.

PROS

- Built-in tiltable EVF
- Comfy handgrip and quality finish
- Body-mounted controls
- Fast AF

CONS

- Image quality not best in class
- No connection for external microphone or video

Camera GOLD

How it stacks up today

Panasonic recently announced the all-new Panasonic Lumix GX8 (see p72). There's no denying that it offers a wide range of improvements on its predecessor, including an entirely new sensor and 4K video shooting mode. That being said, the new model features a price premium of over £1,000, and as such the GX7 still represents great value.

Alternatives

The Olympus OM-D E-M10 features some eye-catching retro design along with a high-quality all-metal chassis and a specification suitable for advanced photographers. Alternatively, the Fujifilm X-Pro1 might be a few years old now, but thanks to its timeless design and larger APS-C sensor, it remains a solid option in this field.



In the range

How the GX7 fits in the range



Panasonic Lumix G6



Panasonic Lumix GX7



Panasonic Lumix GM1

KEY SPECS

SENSOR 16MP LIVE MOS
ISO 125-25,600
BURST MODE Up to 5fps
MOVIE Full HD 1920 x 1080p, AVCHD and MP4
DISPLAY 3in, 1.04m-dot touchscreen TFT
DIMENSIONS 122.6 x 70.7 x 43.3mm
WEIGHT 402g

The Panasonic GX7 Three users give their verdicts

Thomas Geiregger

SALZBURG, AUSTRIA

In 2011, I discovered the art of street photography, and I still find it intriguing to capture a specific moment in time, in which ordinary people are going about their everyday business.

I started off with an Olympus PEN camera, changing to the GX7 because of its fast autofocus and short shutter lag. One particular highlight of the GX7 is its tiltable electronic viewfinder, which enables taking pictures from various positions.

I usually photograph in Raw format, as this enables me to take full advantage of the photograph's potential.

I prefer to use the Panasonic 20mm lens for street photography. Depending on the situation, I use S or A mode. However, when I need to work quickly, I may use P mode. What I also like about the GX7 is the higher ISO settings, which makes it capable of taking high-quality images up to ISO 1600.

The camera's menus enable rapid changes between settings. And the electronic shutter allows a soundless and vibration-free shutter release.

The GX7 sits well in the hand, has a sturdy design, is very compact and, being black, is inconspicuous, which is essential for street photography.

I would love it to have a water-resistant case and a better battery life. Still, if you carry enough spare batteries with you, the latter isn't a problem.

Permajet says: "Thomas's monochrome images would have bold impact when printed on PermaJet's radically enhanced range of fibre-based papers, which have recently been upgraded to exacting street photography requirements."



WWW.THOMASGEIREGGER.COM



1 Planespotting

This picture was taken near Salzburg Airport, where there are a lot of plane-spotting photographers.
20mm, 1/640sec @ f/8, ISO 200

2 Scale

A different point of view of Salzburg Cathedral.
20mm, 1/640sec @ f/4, ISO 200

3 Sint-Annatunnel

This is the 572m-long Sint-Annatunnel in the centre of Antwerp.
17mm, 1/60sec @ f/2.8, ISO 1000

Tim Gilbert

LANDRAKE, CORNWALL

My interest in photography really took off when I bought an Olympus C770 compact in 2004 while travelling in Asia. In such varied and exotic locations, it was easy to be inspired.

After progressing through several Olympus DSLRs, I made the transition to the Panasonic GX7, which had several crucial features for me: built-in EVF, focus peaking, silent electronic shutter, 1/8000sec shutter speed and Wi-fi connectivity.

I find Micro Four Thirds to provide the perfect balance between image quality and portability. I love the fact that I can throw a body and a few lenses in a bag and not even know they're there, but still have the quality available when photographic opportunities arise. I also think that Micro Four Thirds currently has the best range of native lenses.

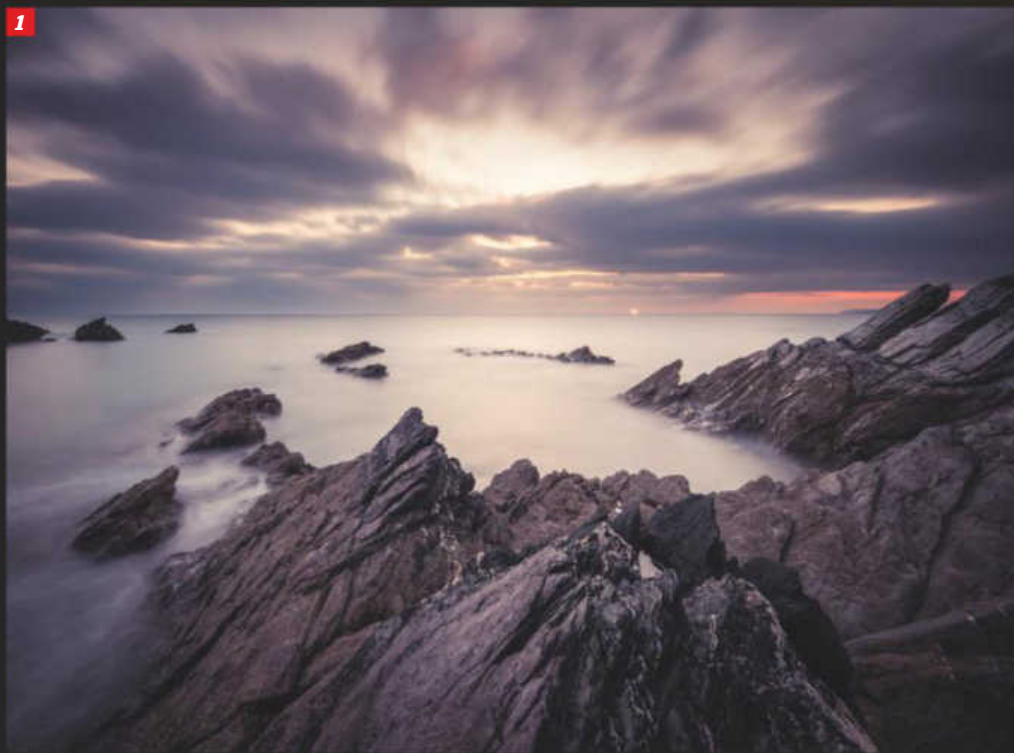
When I'm not taking pictures of my family, I mainly pursue landscape images. Living in Cornwall, we have so many great locations to choose from. Most of my time is spent in Aperture Priority mode, and I always shoot Raw and process using Lightroom 6, as I find processing images to be just as rewarding as taking them in the first place.

For my style of shooting, I feel there are a few areas where the GX7 falls short. It offers excellent image quality in a small package, with plenty of options and customisation options, but a larger viewfinder would be nice. I'd also love it to have weather-sealing, as recently I've had a few close calls with rogue waves!

Permajet says: "Images such as these require pin-sharp prints with high Dmax ratings and colour gamut for detailed ink retention across a wide tonal range – a key feature in PermaJet's Baryta range."



WWW.FLICKR.COM/PHOTOS/TIMOTHYGILBERT



1 Beachscape

This was one of my first attempts with a 10-stop ND filter, taken at my local beach in Cornwall. Olympus 9-18mm, 25 seconds at f/4, ISO 200

2 St Davids, Wales

The 10-stop ND filter has a slight purple cast, which perfectly complemented the sunset. Olympus 9-18mm, 40 seconds at f/4, ISO 400



Trevor Bancroft

WALMER, KENT

After finally giving up my sporting hobbies in 2009, I decided to find something else to occupy my spare time, so I bought my first digital camera. The camera was a Panasonic Lumix DMC-FZ18.

I then invested in a Canon EOS 7D, but after making a couple of trips to London to take some street shots, I decided that I needed a camera that was less conspicuous. After a lot of research, I chose the Panasonic GX7 with 20mm f/1.7 lens (I now have a Panasonic 12-35mm lens, too). I was amazed by the quality of the images, given the size of the camera.

I usually set it to Aperture Priority mode, and I absolutely love the Dynamic Monochrome filter on this camera. I sometimes go out using only this setting, just to see what I can get. I set the camera to JPEG + Raw, as I now use Lightroom for my processing and editing. I also switch between auto and manual focus to suit.

The best feature for me is the viewfinder, which has an eye-sensor that switches from the viewfinder to the monitor. I do not like cameras that only have a monitor screen, as I find it quite difficult to compose with them in bright sunlight.

For me, as an amateur photographer, I have not yet found any weaknesses in the GX7. Perhaps the only thing is that the buttons on the back are quite close together and I keep turning on the Wi-fi by mistake.

PermaJet says: "To make the most of the GX7's strong colour capabilities, Trevor should print on PermaJet's advanced FB Distinction, which incorporates a superior, bright white coating on an acid-free Baryta base for punchy prints."



WWW.FLICKR.COM/PHOTOS/JACKSON22



1 Turner Contemporary

I liked the way the natural lighting enhanced the shapes and colours. 20mm, 1/500sec @ f/11, ISO 400

2 Sunrise

A beach hut at Littlestone, Kent. On a clear day, the sun rises behind it. 20mm, 1/250sec @ f/2.5, ISO 200



3 Marari Beach, Kerala

The beach was full of these amazingly colourful fishing boats. 20mm, 1/800sec @ f/5.6, ISO 125

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Making the switch

Renowned photographer and lighting guru **Damien Lovegrove** explains why he gave up his DSLRs for Fujifilm's X-series cameras

In the digital era I've had Hasselblad and Phase One medium format kit along with DSLRs from Canon and Nikon, but it was about four years ago that I got a Fujifilm X100. I saw it at Photokina in this glass cabinet and it was so beautiful and so retro. I could tell straight away that it was going to be lovely to use. I didn't need it, but I desired it and decided to buy it. I kept bringing it out at shoots and it just transformed the way I worked. It felt totally natural, while the fixed lens meant I had to do less decision-making.

I then added the X-Pro1 with XF18mm f/2, XF35mm f/1.4 and XF60mm f/2.4 lenses. Its first proper outing was my road trip covering the full length of Route 66. My finance

director (Julie, my wife) wouldn't let me put the X-Pro1 camera purchase through the business as it was not an absolutely necessary expense, saying, 'You have a perfectly good Canon camera kit already,' so I paid for the Fujifilm X-Pro1 kit out of my own savings. That made it feel even more special.

The X-Pro1 was a joy to use and the images it gave me matched my Canon EOS 5D MkII for quality. I never picked up the Canon again and I eventually sold it once I had bought the XF14mm f/2.8 prime to replace my Zeiss 21mm on the Canon system.

Fujifilm X-T1

I'm now using the Fujifilm X-T1 for all my day to day shooting. There's lots to love about it but the flip-out

screen on it is perfect for me. I like to shoot from the hip, and use it like a waist-level viewfinder. It allows me to communicate with my subject without having this great big block in front of my face.

All the Fujifilm XF lenses are amazingly sharp wide open and that's where I like to use them most of the time. The XF35mm lens is rapidly gaining legendary status. It's great at f/1.4 for intimate portraits with a wonderfully controlled bokeh.

The Fujifilm advantage is that the system is small, offers super image quality and above all else is a joy to use. The fun I get from photography has a lot to do with the kit I'm using and I've never felt more creative than I do right now. I've said goodbye to DSLRs for good.



For further information, and special offers and competitions visit www.amateurphoto.com

DAMIEN LOVEGROVE

Damien has forged a successful career as a high-end wedding and portrait photographer.



These shots were taken by Damien during his workshop at the Fujifilm X-perience day at the AP offices. Attendees had the chance to shoot with a host of Fujifilm kit under the expert guidance of Damien and fellow X-Photographers Paul Sanders and Matt Hart. If you'd like to attend future events, please email photo_events@timeinc.com



Make a connection: Connect with the person you're photographing. Put the camera aside, have a cup of tea, have a cup of coffee, have a laugh with them. Really get to know them and then bring the camera into the frame.

Perspective: The perspective in a portrait isn't related to which lens you've got on the front of the camera. A wideangle is going to be the same as a telephoto in delivering perspective, but what matters is you relative to your subject. If you use a

long telephoto lens, you'll find to get a mid-shot you'll have to shoot from quite a long way back. It's flattering, but you don't get that connection, that intimacy. You need to work at just beyond arm's length to get something really really beautiful. I'm working with the XF60mm f/2.4, XF35mm f/1.4 and XF23mm f/1.4, and only go to the XF56mm f/1.2 if I want something a little bit tighter.

Plan your style: Decide on the look you are aiming for from the outset, such as high-key, rim lit or moody. Once you know what you hope to achieve from the shoot and have a clear idea of the look you're after, the rest of the process is that much easier.

Review: Review each shot using the camera's screen. Does the picture have the look you want? Is the contrast right? What could make the shot better? Zoom in and check the detail. Is there enough shadow information? Is the shot sharp? Are the highlights clipped? Get it right in-camera.



The Fujifilm X-T1



X-Photographer
X-Perience

www.photographer.co.uk/fujifilm-x

Street and event photographer **Matt Hart** explains why he made the switch to the Fujifilm X-Series



I'm what you'd call a candid street photographer. I don't, generally, shoot people when they know I'm looking at them. My main line of work is shooting events, where I'm always talking to people, getting them to pose in a

certain way; but on the street it's the opposite – I don't talk, don't make eye contact, nothing.

When I changed over to digital, I found DSLRs to be too big and bulky for my work. Also, when I was going out shooting street photography, the cameras were so large that I was getting noticed. When I shoot my event work, I was just getting worn out as I was lugging all this kit around. I'm not getting any younger, so carrying around huge DSLRs and the huge kit that goes with them became a problem. So I changed over to the Fujifilm X-system basically for size and then found out how brilliant they actually were.

I shoot a lot with the X100T and I love that camera. It has a fixed lens equivalent to 35mm roughly, but if I'm using other Fujifilm cameras like the X-T1 or X-T10 for street, I use either the XF35mm f/1.4 (50mm equivalent) or the new XF16mm f/1.4 (24mm equivalent), so that I've got one to get me in a little bit closer and

one to give me a wider view.

While you'd think coming from a film background that my favourite element about the X100T would be the hybrid optical viewfinder, I have to say that I just love the rear screen. To be able to see what you're doing all the time without putting the camera to your eye is great.

The X-T1 is ideal for street photography because of three key factors: the tilting screen, its speedy shooting, and its small size. People don't recognise it as a professional-looking camera, which makes it especially perfect for the kind of photography I like to do.



MATT'S TOP TIPS

Based in Liverpool, Matt has a passion for mono and runs street photography workshops

BLEND IN: I like to go out and be quite miserable. I like to try and keep a poker face, walking around not smiling at anyone, not making eye contact with anyone. It helps me blend into the

background. As soon as you're happy and jolly out on the street, smiling at people, they notice you.

LOW PROFILE: I also like to keep my cameras out of sight.

As soon as people see a camera, they notice you, so I try to keep them below eye level at about waist height, looking for my subject before bringing the camera up to shoot.

CHANGE LOCATION: I like to go to different towns as well. If you're a street photographer and you shoot in the same town, everyone starts to get to know you. It can be a benefit sometimes, though, as

you can start blending in because it gets to the point where people ignore you as you're part of the furniture.

FAST LENSES: One thing that is really a requirement, though,

is a fast aperture. I don't shoot all the way at f/1.4, I generally keep it around f/2; however, that f/1.4 aperture gives you so much more latitude for when it gets darker in the evenings.



Former Picture Editor of *The Times* turned landscape photographer **Paul Sanders** explains why he made the switch to the Fujifilm X-T1

This is not the first time going compact has been a feature of my life; back in 2004 I was instrumental in the way *The Times* changed its view of photography when it downsized from the traditional broadsheet to the more modern and convenient compact format. That was a change that required a leap of faith, commitment and patience.

I swapped to the Fujifilm X-Series from a DSLR and 5x4 large-format camera because I found the cameras were getting in the way. The camera became a barrier to my photography, so by freeing myself up with a smaller and lighter body and limiting my lens choice, it took the indecision out of shooting landscapes and made me connect with my landscape much more than the camera being a brick wall in front of me. Instead, it was just something I saw the landscape through and I was able to translate my ideas and imagination with.

The lens I use most is the XF23mm f/1.4; I absolutely love that lens. It stays on the camera quite a lot of the time, while I also like to use the XF56mm f/1.2 for landscapes. Everybody shoots wider and wider landscapes, but I tend to find that if I close in a little bit, I get much more interesting compositions. They're the two favourites.

My favourite thing about the X-T1 is the electronic viewfinder. I thought I'd hate it, but I fell in love with it almost

straight away. I really like the fact that I can see exactly what I'm getting before I press the shutter. It means I don't spend a lot of time with my eye away from the camera, and I'm not constantly 'chimping' the back reviewing shots. I can see the tones change as I alter the exposure, while when I look through it, the coverage and size is wonderful. So much so that if I ever use a DSLR, I completely forget to alter the exposure because it looks normal and I end up messing everything up. This isn't a problem with the X-T1, it's just beautiful.

I'm happy I have made the switch, and for the second time in my photographic life going compact will lead to interesting and challenging times but I know that I have made the right move for me.



PAUL'S TOP TIPS

Since leaving *The Times*, Paul has pursued his passion for landscape photography

SHOOT FOR YOURSELF:

Shoot the pictures that please you. Don't shoot for anybody else. If you start worrying about what other people want or like, you won't shoot pictures that you're happy with. It's quality time by yourself usually, so invest that time in something you truly enjoy.

DON'T CHASE THE LIGHT:

Go out when you least expect to get a great picture. Go out when the weather is bad. Don't always look for that fabulous, wonderful light, because from my experience, it rarely happens. I'm always standing in the rain, but you'll get completely different pictures from other people, as most are fair-weather photographers.

MAKE IT FUN:

Another useful trick is to bring

an element of fun back into your photography. Challenge yourself by setting yourself little tasks and projects that are only relevant to you. You don't need to show them to anybody, but it'll force you out of your comfort zone.

CHALLENGE YOURSELF:

One thing I really enjoy doing is taking my least favourite lens and just shooting on that. Not allowing myself to shoot on anything else for a couple of weeks. It forces you to change the perspective from which you shoot and it makes you think about your photography, your positioning, the way the lens works.

AVOID YOUR COMFORT ZONE:

Try shooting landscapes at f/2.8, try a montage or multiple exposures. Just take yourself out of that comfort zone, that rut, which can make your photography become bland and predictable. You'll get an absolute load of rubbish to start with, but all of a sudden you'll find it will click, you'll start to see things differently, and then you'll be inspired.

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Even shooting at f/5.6, it's possible to get a pleasing defocused background

Into the wild

Is Nikon's 80-400mm f/4.5-5.6G ED VR lens perfect for a once-in-a-lifetime photo safari, or did **Phil Hall** wish he'd packed something more exotic?

WORDS AND PICTURES **PHIL HALL**

The Masai Mara Wildlife Reserve in the west of Kenya has rich vegetation and wide-open savannahs, which makes it one of the most prolific areas for wildlife in the world. It's a photographer's dream, and when I discovered I'd be experiencing this fabulous place first-hand alongside wildlife photographer Paul Goldstein on a dedicated photo safari, I wanted to make the most of the opportunity.

Kit choice

Choosing which camera to take was pretty easy – I quickly plumped for the Nikon D810. However, deciding on my main lens proved much more difficult. My Nikkor 70-200mm f/2.8 wasn't going to have the reach, so my mind drifted towards some of Nikon's exotic primes, such as the 400mm f/2.8 and 500mm f/4. With prices running into five figures for these, there was no way I was going to be able to afford one, but for a fraction

of the cost I could hire one for the week from a hire company such as www.lensesforhire.co.uk.

These stunning optics would be in their element out in the field, but having lugged a 400mm f/2.8 around with me at a premiership rugby match last year I know they're back-achingly heavy. I also had to consider transportation – I didn't want to take the chance of checking my kit into the hold on the flight, so my gear had to meet Kenya Airways' hand-baggage allowance of measuring 55 x 25 x 35cm and weighing no more than 12kg. While there are some bags out there that would have done the job, getting all the other kit in as well as

the 400mm would have been a struggle – even though the weight limit would easily have been met.

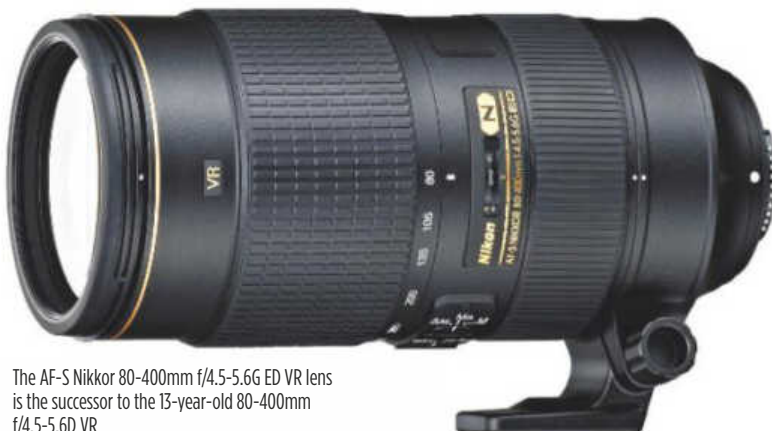
I reluctantly decided to drop the idea of taking a large telephoto prime, which led me to having to choose between the 200-400mm f/4 and the 80-400mm f/4.5-5.6.

The 200-400mm is a cracking lens, but after a lot of deliberation I settled on the 80-400mm. The AF-S Nikkor 80-400mm f/4.5-5.6G ED VR is the successor to the 13-year-old 80-400mm f/4.5-5.6D VR – Nikon's first lens with Vibration Reduction. The wider focal range meant I could leave my trusty 70-200mm at home and happily pack just two bodies, the

KEY SPECS

AF-S Nikkor 80-400mm f/4.5-5.6G ED VR lens

PRICE: £1,899
MOUNT: Nikon F
LENS CONSTRUCTION: 20 elements in 12 groups
DIAPHRAGM BLADES: 9
MAX APERTURE: f/4.5-5.6
MIN APERTURE: f/32-40
MINIMUM FOCUSING DISTANCE: 175cm
FILTER SIZE: 77mm
DIMENSIONS: 95.5 x 203mm
WEIGHT: 1,570g



The AF-S Nikkor 80-400mm f/4.5-5.6G ED VR lens is the successor to the 13-year-old 80-400mm f/4.5-5.6D VR

80-400mm and 24-70mm f/2.8, into my LowePro Vertex 200AW backpack without worrying about baggage restrictions. There was no denying the weight and versatility advantages offered by the lens, but had I put this at the expense of image quality, especially when combined with an unforgiving 36.3MP sensor?

First contact

Flying in over the Masai Mara in our little 13-seat Cessna Caravan from Nairobi, we caught a glimpse of what lay ahead, with giraffes and herds of elephants roaming below us in the bush. After being transported to our beautiful tented camp in the middle of the bush, we just had enough time to drop our bags and grab some lunch before heading out for an afternoon's game drive.

With three of us to each Toyota Land Cruiser, along with our guide/driver, we left the camp. My bag was down at my feet, with the D810 and 80-400mm ready to go. I'd set my camera up with back-button focus – something I started doing a couple of years ago and it's been a revelation. Rather than relying on focusing with the shutter button (which I've deactivated for AF and only triggers the shutter), I press my thumb down on the AF-ON button at the rear of the D810. With continuous AF set, I find it much easier to track a moving subject. It also means I don't have to mess around switching to single AF for static subjects – I can focus on my subject, lift my thumb off the AF-ON button and recompose before firing the shutter. I chose the centre AF point, but to assist with moving subjects I opted for dynamic-area AF with nine points, so if my subject were to move out of the centre AF point the surrounding eight would be able to pick it up. As for the lens, I flicked the focus-limit switch over to ∞-6m from full to speed up AF acquirement.

With our Land Cruisers equipped with plenty of beanbags to rest lenses on, monopods weren't necessary (plus, they'd get in the way). I opted to leave the VR mode set to normal, with active coming into play only if we shot from the Land Cruiser as it moved across the bush.

At about 3pm our Land Cruiser came to a halt 15m from a lone tree where a lioness had decided to position herself halfway up – quite an unusual sight, by all accounts, but our guide told us that she'd done this to get away from the swarms of flies

The size of the 80-400mm meant I could travel relatively light



buzzing around the reserve. The rest of the pride didn't seem as fussed by the insects, so were lounging on the floor beneath her, having fed earlier in the day.

Standing in the Land Cruiser, I raised the D810 to my eye, twisting the zoom ring to 330mm to fill the frame with the lioness. A light touch of the AF-ON button saw the viewfinder snap into focus and I fired off a few shots. The results weren't going to win any awards with the light as it was, but it was my first taste of shooting big cats on the Mara. It also gave me the chance to see the results from the lens and I was pleased (or should that be relieved?) to see that the images appeared nice and sharp – at least on the D810's rear screen.

My first encounter with a big cat on the Masai Mara and my first chance to put the 80-400mm through its paces. It didn't disappoint

Testing conditions

With a storm approaching, we continued on our game drive, but before long the heavens opened. Since our Land Cruiser was open-

sided and sported two large roof hatches, we – and our kit – got soaked before we had time to pull the covers over. Thankfully, the 80-400mm has a rubber gasket seal on the mount for added protection, and appeared to be unscathed (although Nikon doesn't make any claims to it being fully weather-sealed). Constructed from a combination of high-quality plastics and metal, the 80-400mm also feels nicely put together and tips the scales at just under 1.6kg. If I'm being picky, though, it doesn't have quite the same bombproof feel as my 70-200mm f/2.8.

Over the next three days, I really had a chance to put the 80-400mm through its paces. The autofocus didn't let me down at all. Even when juvenile cheetah cubs were chasing down an impala fawn, it didn't miss a beat and tracked the fast-moving subjects with incredible precision. It also did a fantastic job in low-light conditions – early starts and late finishes were a common theme each day, and the D810 and 80-400mm combination meant I didn't experience any hunting issues.

While Paul encouraged us to use the beanbags for support, the 80-400mm was easy to handhold and, for me, I preferred the freedom it offered. While I could quickly move position as the action unfolded in front of me, it also meant that my ability to zoom through the focal range wasn't impeded by resting the lens on the bag. While I aimed to shoot at shutter speeds above 1/500sec on most occasions, there were times when I had to rely on





“Flying in over the Masai Mara, we caught a glimpse of what lay ahead, with giraffes and herds of elephants roaming below us”

the 80-400mm's VR system to counteract any of my movement as the light dropped and I was forced to extend the shutter speed. There's no disputing the four-stop improvement it offers – compared to the two stops delivered by the original lens – but while it's possible to shoot as low as 1/25sec and still achieve sharp results, you have to be mindful that movement from your subject could become an issue.

Image quality

Back at camp in the evenings, before a well-earned beer or glass of wine around the camp fire, I had a chance to review my images on a larger screen and have a tinker with them in Lightroom. Wide open at 200mm, the lens does exhibit a bit of fall-off in edge sharpness, but closed down a stop or two images become edge-to-edge sharp. At 400mm, the edge sharpness does suffer a little more, but not so much that it becomes detrimental to the image, and the centre is pin-sharp. Vignetting is a slight issue when shooting with the lens wide open through the focal range, though, so I found it worthwhile to select the relevant lens profile in Lightroom to correct for it. This also revealed very minor pincushion distortion at higher focal lengths, but again, this is easily remedied.

Downsides

There's not much to fault on the 80-400mm lens, but there are a couple of things I'd like to see refined. First, and it has to be said that I didn't have any need for it while I was shooting, the tripod collar appears too small for the size of the lens it needs to support. I'd also like to see Nikon take a leaf out of Canon's book when it comes to the lens hood. While shooting alongside photographers who had Canon's latest 100-400mm, I noticed they

When you consider that the lens provides a 5x focal range, image quality is very good and delivers sharp results

could happily adjust the position of their polarising filter through a little sliding opening on their lens hood, whereas I either had to leave the hood off if I wanted to use a polariser and work quickly (it would have been a bit impractical to keep attaching and detaching the hood), or not bother with the filter at all. To be fair, though, that's not unique to the 80-400mm.

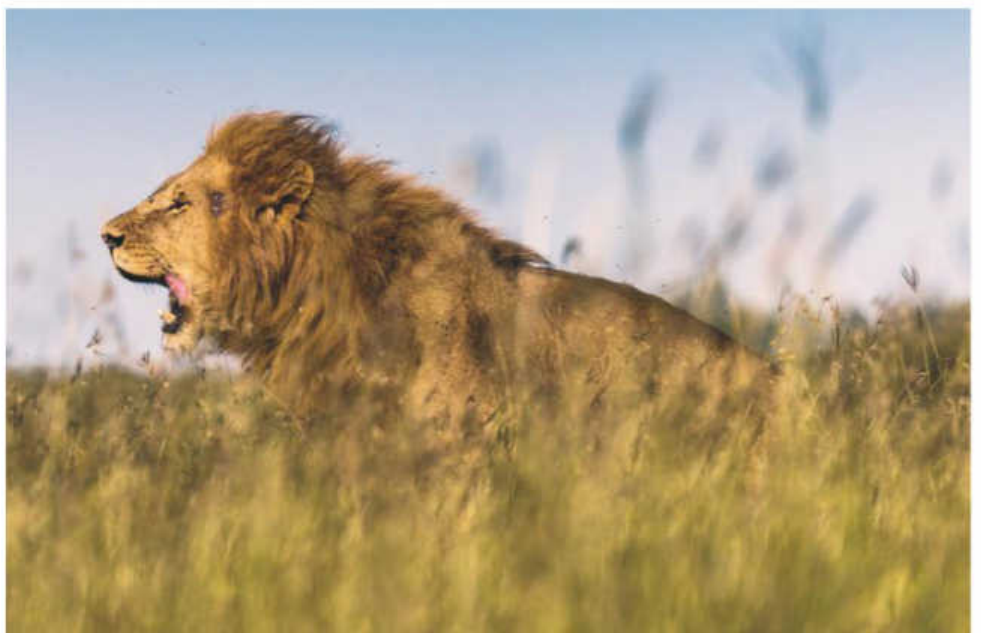
Final thoughts

While there's no question that the pricier Nikon optics would have delivered the goods, the 80-400mm lens has a perfect blend of performance and size. With space at a premium, it didn't take up masses of room in my bag or in the back of the Land Cruiser, while its relatively compact form factor meant I could lug it around and position it quickly.

The AF is fast and accurate, performing well in low light and backlit conditions, while the quick tracking ensured I didn't miss any of the action. Together with the excellent VR system, smooth handling and solid finish, there's a lot to like. As far as image quality goes, I was pleasantly surprised. The images weren't perfect, but considering the lens covers a 5x zoom range it's very impressive, especially when you weigh up its cost compared to the other alternatives.

So, after agonising about which long lens to take with me before I set off, I didn't regret my choice. In fact, I should probably have worried more about the second lens I took, as I found the 24-70mm not quite wide enough for those large skies and wished I'd packed a 16-35mm instead.

The focus worked extremely well here, ignoring the long grass in the foreground to lock on to the lion



No flash required

Who needs a studio when the perfect source of illumination is all around us? Read on for our guide to making light work of portraiture...

WORDS AND PICTURES DAMIEN LOVEGROVE

When you think of doing a portrait shoot, it conjures up images of slick studio settings with multiple complex lighting set-ups using flash, infinity curves and Colorama backdrops. It can be easy to fall into the trap of thinking that the model is secondary to the kit and complicated technology, rather than the primary consideration.

However, this doesn't have to be the case. Daylight, in its myriad forms, provides just as much versatility, variety and potential for creativity as any studio flashlight – and it's free.

When shooting inside, you can use the soft light from a north-facing window to create the flat wash of shadowless, flattering light so favoured by artists across the centuries. At the other end of the extreme, bright sunlight from the due south can be modified through shutters or curtains to create a slit of light to

dramatically emphasise just one part of your model's face or body.

Equally, the potential for successful portraits outdoors is vast, be it using the dappled conditions inherent in a woodland, flat light on a bright but overcast day, or even shooting into the sun in harsh conditions, creating a high-key, overexposed effect.

The important thing is to know what effect you're looking for, as this frees you up to concentrate on developing a rapport with your model, ensuring the best possible results.

There are various tricks to modifying daylight to make it work for you. The most common way is by using a reflector. They can be purchased with two sides of different colours, or you can simply purchase a sheet of white A2 card from an art shop and use that. Cover one side with aluminium foil to give you a brighter alternative.

The light from a window can be every bit as dramatic as anything created in a studio setting.
Fuji X-T1, 50-140mm at 50mm, 1/125sec @ f/2.8, ISO 800

Tip 1 Capture the moment or the mood

Once you've got the technical aspects sorted, take time to engage with your sitter. Put the camera to one side and discuss the mood you want to create. Don't expect your sitter to be an actor – you will have to create the mood to get the reaction you want. The approach I take when working with children and adults is the same, although the techniques are different. If you want an intimate, natural look you need to pull that look into the lens. This takes rapport, trust and respect on both parts, but when the mood clicks, magic happens. If you are shooting a heavy, sad or emotional look, do lighten the mood with laughter once you have the shot. I like to share my images on the back of the camera as I go. That way the sitter feels more involved in the creative process.



It's crucial to build up a rapport with your subject, for natural results



Tip 3 Lean in

Transfer your subject's upper body weight on to surfaces. Unless you are photographing top pro models who have a well-rehearsed ability to look fabulous standing in open space, use a wall, pillar, door frame or piece of furniture for your subject to lean on, against or lie on. By transferring their upper body weight to a resistant surface, your sitter will be far more relaxed. If I'm using a wall, I like to shoot at an acute angle to give the picture depth.



Make a dramatic background an integral part of the image.
Fuji X-T1, 14mm,
1/125sec @ f/3.6,
ISO 800

Tip 2 Big up the background

If the background is particularly impressive or adds to the narrative of the photograph, consider using a lens with a wide field of view to really make it part of the shot. In my opinion, there is no such thing as a lens that is too wide for portraiture. I love using 14mm

on APS-C or 21mm on full-frame to make the most of a background. The other option, if you have enough space to allow it, is to back away from your subject and use a lens with a narrower field of view. Either way, if you have a fabulous background make the most of it.

Tip 4 Shoot at 90° to the light

Some of my best portraits are shot with the light falling on my subject at right angles to my camera position. The closer the camera gets to the angle of the light source, be it skylight through a window or sunlight in the open, the flatter the image becomes. I only move round to close the angle if I want eye contact. I shoot about 50% of my portraits without eye contact.



Tip 7 Great locations

Great locations are key to the success of a daylight portrait. The good news is, great locations are all around us. City centres, recreational parks and the home you live in all have pockets of opportunity for making portraits. If you're shooting inside, you can remove unwanted clutter in a background by moving your subject closer to a window and allowing any confusing detail to disappear into the shadows. You can also render a background out of focus by using a wide aperture. This is especially useful outside. I often look for the best light first and then decide what to do with the background afterwards.



Tip 5 Intimacy

Intimacy is partly a result of the photographer's proximity to their subject. The closer you are, the more intimate the portrait can appear – especially if there is eye contact. Too close and there will be distortion. For relaxed head shots I often use a standard or medium telephoto lens and keep within 2m of my subject. For a more intimate portrait, I might work as closely as 1.5m with a standard lens.

Tip 6 Manipulate the light

Manipulate the light to make it do what you want. Inside, try partly closing blinds or curtains until only a strip of light is left. This will increase the contrast in the room by darkening the shadows. If you have sunlight, you can reflect it through a window or into a shady area outside to create a pool of gorgeous light.



Close curtains to emulate the look of a softbox striplight



Tip 8 Couples

When you are photographing two or more people, think about adding variety to your shots by creating separation of the foreground and background, or use differential focus to make one person the subject with the other out of focus. Think about what the picture is saying, too. Are the couple an item? Perhaps they are siblings. Either way, their body language should clearly reflect their relationship.



Pre-focus to be sure of capturing action. Fuji X-Pro1, 18-55mm at 18mm, 1/250sec @ f/4.5, ISO 400

Tip 9 Capture action

If you want to capture movement, it's your job to direct the action and maintain control of it. Place the person you are photographing in the perfect position for the peak of the action, set the camera focus to manual and pre-focus. Dial in the exposure required, ask your subject to go back a few steps – then cue the action. This is especially useful for running or jumping shots. You can leave the camera set up in position and even use a tripod. It's just a case of repeating the action until the perfect frame is captured. Use a shutter speed of at least 1/250sec to freeze action.

Tip 10 Direction of light

The direction of light is extremely important, but don't get hung up on it and forget about everything else. I like to think that if the shot looks good, it *is* good. With direct sunlight or directional soft light, from a north-facing window, for instance, I regularly 'light down the nose'. By this I mean I have my subjects' nose point towards the direction of the light. This creates beautiful shadows under their cheekbones and ideal modelling on their face. I nearly always shoot into the unlit side of the face, too. Sometimes I shoot directly towards the light with my subject between me and the light, or oblique to the light to create low-key rim-lit portraits. The principal concern is to avoid unsightly shadows or shadows that fall across the face or body in an unflattering way. You can't soften a shadow by reflecting in fill light – you can only reduce its contrast. The shadow will still be there.

Ask your model to turn her head slowly in one direction or another to assess the way the light falls on her face.
*Fuji X-T1, 35mm,
1/30sec @ f/2, ISO 400*

Tip 11

Break the rules

Break the rules with exposure to keep skin tones looking vibrant or your pictures dramatic. Modern mirrorless cameras give an accurate preview of exposure in manual mode. If you prefer to use one of your camera's auto modes you will get a preview of your exposure compensation. This preview means you can get creative with exposure and see the results before you press the shutter. With SLRs, simply shoot and check, then adjust, shoot and check again until the shot looks just right on the camera screen. Ignore histograms and don't worry about burned-out highlights – just look at the skin tone and the vibrancy of your subject. When you are shooting into the light, you can shoot silhouette or low-key rim-lit shots. By increasing the exposure by several stops, it is often possible to create high-key portraits in that same space. Get creative with your exposure and take control.



Backlighting is perfect for bringing out soft detail.
Fuji X-T1, 16mm, 1/125sec @ f/1.4, ISO 200

Tip 12

Less is more

A few details often say it all. A portrait doesn't have to show everything. I sometimes use detail to express the moment or feeling in a way that would be over-complicated if I took a wider view. A good medium telephoto macro lens is a useful tool for capturing details. Sometimes I shoot wide from behind and I regularly shoot my portraits in profile. When I'm working for a client, I like to get the obvious head shots and mid-length portraits with eye contact out of the way first, and then move on to the more creative work that is probably what appealed to the client in the first place.

A detail can convey as much emotion as a full-face shot.
*Canon EOS 5D Mark II,
100mm Macro,
1/60sec @ f/2.8,
ISO 1250*



Tip 13

Dark interiors

Dark interiors often make great shooting locations. Use a monopod or a lens with image stabilisation, but be careful with subject movement: seat your subject or have them lean against a wall. Use a high ISO if you need to. It's far better to use ISO 3200 and have no camera shake or subject movement than to use ISO 400 and have unintentional blur.



Tip 14

Crop the sky out of your pictures

It might sound obvious, but a highlight at the top of your frame will draw the viewer's eye away from your subject and reduce the impact of your portrait. The sky has to be exceptional to consider it a worthwhile component. A deep blue cloudless sky can make a fabulous backdrop if you're shooting in monochrome, or form a key element when shooting colour portraits using primary colours. But generally speaking, the rule is, if in doubt, leave the sky out.



Midday sun isn't always off limits.
*Fuji X-Pro1,
55-200mm at
140mm, 1/750sec
@ f/4.4, ISO 200*



Tip 15

Shooting in the sun

Don't discount shooting in full sun in the middle of the day. I was always told that midday sunlight should be avoided for portraiture, but have found through necessity when photographing weddings that fabulous portraits can be made as long as you shoot into the light, work in the shade or shoot with reflected sunlight. You can use the sunlight direct, too, if your subject wears sunglasses or a hat. Look out for shadows and patterns and be creative with these.

Superzoom bridge or entry-level DSLR?

THE DOOD

Q I've been using an Olympus XZ-1 compact for a couple of years. I generally take a few hundred photos a year, mostly just walkabout scenic shots and occasional holidays, etc. I realised the other week that I must have taken more than 10,000 photos over the past 15 years or so. I figured this puts me into the 'probably more than hobby' bracket. Recent reviews of the Nikon P900 got me interested. I quite like the idea of the ridiculous zoom range giving me the opportunity to take shots that I wouldn't be able to take with (almost) any other camera. That said, the 'lack' of image quality puts me off a little. I say lack, but I still think the quality

I get from my XZ-1 is good, so maybe I wouldn't notice the difference? The other side of the argument is that if I'm going to fling out 500 bucks on a camera, I don't really want to settle for so-so image quality (Sony RX10 for only £100 more?). Or is an entry-level DSLR the way to go?

A Our premium bridge camera choice is the Panasonic Lumix DMC-FZ1000, with the Sony RX10 a close second. Both have a fundamental advantage over the Nikon P900 and that's

their use of 1in sensors rather than the relatively tiny 1/2.3in sensor used by Nikon. The FZ1000 is not as cheap as a P900 but it is cheaper than the RX10. On the other hand the RX10 boasts a quality

magnesium alloy build and is less bulky than the FZ1000.

But the Panasonic is bigger for a reason and that is that its telephoto reach is twice as powerful. On



Go for a premium bridge like the FZ1000 or RX10



top of that you get 4K UHD video shooting capability with the FZ1000. From what you have said it looks fairly clear that a premium bridge camera such as the FZ1000 or RX10 would be perfect for your needs rather than a DSLR. **IB**

Olympus vs Sony

KATIE JANE COLLINS

Q I use a Nikon D3100 with the standard lens and I'm just not loving the shots. They're not very bright or sharp. Every blogger seems to have the Olympus Pen E-PL7, adding on the m.Zuiko 45mm 1:1.8 lens for bigger outfit/landscape shots. While this is a great camera, I dislike that it doesn't have a viewfinder. Because of this, a salesman suggested I get the Nikon AF-S 35mm DX lens to add on to my Nikon D3100 and I have done this. But I still want a CSC. So now it's between the Olympus Pen E-PL7 with the 45mm lens or the Sony RX100 Mark II. The sales assistants in both Jessops and John Lewis spoke very highly of both, making my decision almost impossible.

A First, the RX100 isn't a CSC (Compact System Camera), it's a premium compact camera

with a non-interchangeable zoom lens. The RX100 also has a smaller image sensor than the E-PL7, which keeps the camera small but means its low light or high dynamic range performance won't be as good. Both have optional viewfinders, although this adds a lot to the total cost. You could look at the Olympus OM-D E-M10, which has a built-in viewfinder, although this is a bit larger than an E-PL7. Panasonic's DMC-GM5 is another compact Micro Four Thirds CSC with an integrated viewfinder. You might want to consider the Sony Alpha 6000, which is a true system camera featuring interchangeable lenses and it has a built-in viewfinder in a very compact design, plus an outstanding autofocus system. The Olympus and Panasonic Micro Four Thirds system can boast substantially more lenses to choose from though. **IB**

Are there any bad DSLRs?

ROGER MAC

Q Sitting in a beach hut this afternoon and wondering if the Red Arrows would cancel (they did) I fell to wondering if anybody makes a bad DSLR any more. We are often asked to suggest a 'best' camera and, in a range of a few hundred to several grand, some will have features that others lack but I suspect that it boils down to whether one thinks lenses should rotate clockwise or anticlockwise, or other superficial preferences.

A It has been a long time since I experienced an unacceptably poor DSLR, or indeed an unacceptably poor system camera or premium compact or bridge camera. Last year, I looked at some old cameras and even these produced really good results, but the cameras were harder to use and more vulnerable to tricky shooting conditions. In ideal conditions you should expect good results with pretty much all current cameras from reputable brands. Some lenses may exhibit some

purple fringing, which is easy to fix in post-processing, while some cameras and lenses may deliver particularly outstanding sharpness and resolution. What differentiates camera models now is how hard you can push them. This could mean how well they work in low light or how effective the focusing is under different circumstances; for example continuous AF for sports and other action photography or how well the image stabilisation, if present, works. Personal preference is another big factor and as you say even simply things like the direction in which the focusing ring on the lens works might be a deal-breaker for you, although some lenses with fly-by-wire focus control can offer you a choice of direction. What is in no doubt is that today photographers have the richest choice of excellent cameras and lenses to drool over in the history of photography. However, equally not in doubt in my mind is that a really good photographer will be less limited by the gear used. **IB**

Advice for photographing my active children

ALI MAY

Q I'm a photography newbie, but I've just started blogging and I want to get a camera that will give me more professional results and that will make it easier to capture my (highly active) children on film without the resulting blurriness. A lot of the photographs I take will be indoors. I love the idea of a DSLR, and my current frontrunner is probably the Nikon D3200, since it sounds like it's an excellent choice as an entry-level model for a beginner. I also considered the D3300, but obviously it's more expensive – is there much to choose between the two, given that I am a beginner? But my main issue with a DSLR is the size. I'm pretty torn between whether I'm best off with the quality of the photos that I'd get with a DSLR and whether it's really going to be too unwieldy to carry about with me. I don't really want to spend more than £400 all in, and

closer to £300 would be better. All suggestions are appreciated. Please can you recommend a decent compact camera for around that budget? I'm also wondering if a DSLR is overkill, but when my son's being chucked in the air I'd really love to be able to capture his laughing face. That's the sort of shot I want to get, although I also want to experiment with landscapes, macros, and the like.

A *The D3300 is an evolutionary rather than revolutionary development of the D3200. The D3300 can shoot continuously at five frames per second instead of the D3200's limit of 4fps and the D3300 has an advantage of being able to shoot at ISO 12,800 instead of 6400 which means the D3300 can work in lower light or you can force the camera to*

A DSLR is better for shooting children in action than a compact



maintain a faster shutter speed to freeze action. These points are advantageous but whether they will benefit you is not clear cut. You might find that flash will do a better job of freezing the action generated by your kids. A DSLR also has the advantage of good shutter response, which some compact cameras may not be able to match. This could be critical for capturing magic action moments. Your budget also limits your choice so other system cameras that might be recommended, like the Sony Alpha 6000, are out of the question, unfortunately. IB

Help with choosing a CSC

PROUD MAMA

Q I currently have a Nikon D3200, although, sadly, life got in the way and I haven't done any proper photography for about three years now. I'm currently planning a trip to Florida next year (I last went four years ago) and, based on my last visit – what with the rides, carrying the camera all day and running round after my two young kids – I've decided that the D3200 ends up being more of a nuisance at times purely due to its size and weight. So I'm looking for a CSC, one with a decent zoom and naturally it has to be good quality. But I almost feel that I'm out of the photography loop now and could do with some advice.

A *If you don't need an eye-level viewfinder the Panasonic Lumix DMC-GM1 is tiny and yet features a Four Thirds sensor and a choice of over 40 interchangeable lenses. The GM5 version is slightly larger to accommodate an electronic viewfinder but remains impressively small. Also small but less expensive is the Panasonic GF7. There are also Olympus Pen models like the E-PL7 to consider, which are more compact and are compatible with the same Micro Four Thirds lenses. Sony's Alpha 6000 is a great camera but there is not as*



The GM1 is small and has great image quality

much choice of lenses and if you want a superzoom it will be bigger and heavier than an equivalent Micro Four Thirds lens. Samsung NX and Canon EOS-M systems are worth consideration but Sony and Micro Four Thirds' Panasonic and Olympus are top of the pile at present. IB

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Which camera will suit me as a newcomer?

SIMON FOY

Q I am new to photography and am looking to buy a used camera, so need some advice. I was diagnosed with cancer a few years ago and have been twiddling my thumbs about a new hobby for some time. Then my son lent me his camera, a Canon 70D, and I found I really enjoyed taking photographs. My son is doing a college media course so I can get some help from him, but as he is new to it the help is limited for the time being. I want a professional camera, something I can learn and grow into, as opposed to buying a mid-range one and then upgrading in the future. Time, unfortunately, is not on my side. I was looking on eBay at the various Canon EOS 1Ds, the Mk 1 to the 3, and also at the 550D Mk3. Video is important to me, but ultimately image quality is the most important thing I want from a camera. I like the size of the 1D as chemotherapy has given me neuropathy and having held the

EOS 1DX I find it easier to handle than I would with a smaller camera. My in-laws have a Nikon D90 and that is too small for me with my hands being what they are. So in essence I am stuck between the 550 and the 1D and am lost from there on in. I have a budget of around £1k for the body alone, lenses I can get in time. I am looking to eBay for a used camera at that price.



Firstly do you mean a Canon EOS-5D Mark III? There is no Mk3

version of the 550D and in any case the 550D is not a professionally specified model. It's probably wise to stick with Canon as your son is already a Canon user and he will be able to help you through his familiarity with the Canon way of doing things and you could borrow some of his gear, like lenses. One

problem is that his EOS 70D is not full frame, so any EF-S lenses your son has that will work on his 70D body won't work on an EOS-1D or a 5D Mark III. But EF lenses will work on both. As for even a 1D Mark III, there is no video capability so you would need to look at a 1D Mark IV. The 5D Mark III would be the more sensible choice. You can get bargains on eBay but it's safer to buy from a dealer and some offer a wide range of attractively priced used gear. IB



We recommend getting a 5D Mk III from a dealer

New full-frame lens or save for top-end body?

PHOOKOO

Q I managed to win a RIBA Plymouth landscape competition and I'm very happy with the £250 prize. But now I need some input on how to invest it. It's my first competition win and I've always said that when I go full-frame (I shoot with a Nikon D7100 currently), I'd save and go for the best option, which for my tastes would be the D810. I've already got a bit saved but it would still be a way off. My other option would be to upgrade my landscape lens, a Sigma 10-20mm f/4-5.6, and go for the daddy, a Nikkor 14-24mm f/2.8G. My concern is that if I do that, I wouldn't be using the lens to its potential because of the crop factor.



The 14-24mm f/2.8 is useful for landscapes



The Nikkor 14-24mm f/2.8G when used on your D7100 will have a field of view comparable to a 21-36mm zoom. 21mm is still considered an extra-wideangle,

if not ultra-wideangle view, while at the other end of the zoom range 36mm is actually very useful, even for landscape photography, which is not just about getting the widest of perspectives. The 14-24mm is also a very sharp lens and with your D7100 you will be using the sharpest central part of the lens optics. So as long as you really are committed to going full-frame then the 14-24mm is a good long-term investment even for short to medium term use with your crop-sensor D7100. Then again, if you are already producing prize-winning work with your D7100 you could of course invest in some DX lenses and save a lot of money. IB

Next month



© LEE FROST

Beside the seaside...

Our coasts offer endless potential for pictures of all moods and in every season. Read our guide on how to make the most of them.

Sony A7R II

With its super-high resolution 42MP sensor and 4K video capabilities, Sony's new mirrorless camera is a force to be reckoned with.



Essential guide to filters

Everything you need to know about what they do, how they work and when to use them.

Fuji 90mm f/2 lens

Should this classic portrait format focal length become part of your armoury?

On sale
25 September

The 5 best 50mm primes



If you own a DSLR or CSC but don't have a 50mm prime hidden away in your bag, you'll struggle to say your kit is complete. While zooms are great for situations when you want to shoot wide one minute and close the next, they're typically not as fast as primes and don't always lend themselves to every type of situation.

If you'd like to shoot faster in low light, create images with an extremely shallow depth of field or replicate the focal length and central field of view of the human eye, you'll want to add a 50mm prime to your wishlist. Best of all, they can be picked up cheaply and they're not just for full-frame users either – attach a 50mm lens to an APS-C DSLR and you've got yourself a short and fast telephoto lens that's ideal for portraiture.

Turn over for our rundown of the **BEST 5 on the market...**

Key points of a 50mm prime lens

Maximum aperture

The cheapest 50mm primes feature a f/1.8 maximum aperture. Expect to pay considerably more for an f/1.4 or f/1.2.

Third-party options

As well as looking at your own brand, it's worth considering third-party alternatives, which can be just as good, if not better.

Switches

50mm prime lenses have a basic design. In most cases, you'll find just one switch on the barrel to control MF/AF at the side.

Construction

Study the construction carefully. The cheapest examples typically feature a plastic lens mount.



P68 Accessories

- 3 Legged Thing EV03 Punks Rick
- Zkin Mayura Protective Wrapper
- Re-fuel by Digipower power bank
- Ansmann Powerline Vario
- Vanguard Divider Bag 40



P70 Camera tests

This month, we check out the **Canon EOS 760D** – released the same time as its near twin, the EOS 750D. We also test the **Panasonic GX8** and the latest in **Sony's RX100** range.



P76 Lens tests

The lenses for X-series photographers keep on coming, with the **Fujifilm 16mm f/4** being the latest addition to the stable. Fast, wide and super-sharp, it's well worth considering.



5 Pentax SMC DA 50MM F/1.8 £99



Pentax users looking for an inexpensive 50mm prime lens will be tempted by the SMC DA 50mm f/1.8. Designed for use with Pentax's APS-C DSLRs that use the manufacturer's K-mount, the lens offers a 76.5mm equivalent field of view – an ideal focal length for those wishing to shoot portraits and many general subjects where it's preferable to create a shallow depth of field to ensure a subject stands out from its surroundings.

Measuring just 63 x 38.5mm, it's the smallest 50mm lens in this round-up and features an optical construction that's comprised of six elements in five groups with

seven aperture blades. A closer look at its specification reveals it can focus to within 45cm of a subject, it accepts filters that feature a 52mm thread and it's an incredibly lightweight lens, too, weighing just 122g on the scales. One way that Pentax has managed to keep the weight down has been to use a plastic mount at the rear, however, this isn't as strong or as robust as the metal mounts you'll find on the other four lenses here, so you'll want to attach it with care.

The front element doesn't rotate when the lens focuses – good news for those who like to use filters, but the lens isn't entirely silent in use, which is due to the focusing system being screw-driven. It's not uncommon to hear whirring noises as the lens goes about its business and if you like to shoot an occasional video and don't want this whirring to ruin your audio we'd recommend switching it to manual focus first. The focus speed is rather hasty and the sharpness at the centre of the frame when it's used wide open is good, too. Users

can expect a fall-off of illumination at the edges when it's opened to f/1.8, but vignetting disperses by the time you reach f/4.

Other than its plastic mount and the fact it's not totally silent when it focuses, the SMC DA 50mm f/1.8 is a capable prime lens that's good for the price. We particularly like the way it can be tucked away in a jacket pocket when you want to travel light, and for Pentax users looking for an inexpensive prime, it's worth adding to the kit bag.

KEY SPECS

FILTER DIAMETER
52mm
CONSTRUCTION
6 elements in 5 groups
DIAPHRAGM BLADES 7
MAXIMUM APERTURE
f/1.8
MINIMUM APERTURE
f/22
MINIMUM FOCUS
45cm
DIMENSIONS
72 x 52.5mm
WEIGHT 122g

PROS

- Small and compact
- Lightweight
- Inexpensive

CONS

- Noisy autofocus
- Plastic lens mount

WDC RATING

★★★★★

Camera RECOMMENDED



It has its pitfalls, yet it's a lens that creates an attractive depth of field

4 Nikon 50MM F/1.8 G AF-S LENS £140



The key advantage of this lens compared to older variants is that it features an internal AF motor, which opens up the opportunity to use it with Nikon entry-level DSLRs such as the D3300 and D5500. The fact that the AF motor is a Silent Wave Motor (SWM) is an added bonus and ensures a fast and quiet focusing performance – great news for those wishing to shoot video.

Of course, it is the construction of the lens however that will interest most photographers. The inclusion of an aspherical element

takes the construction of the lens to seven elements in six groups, and the aperture blades are curved to create almost circular bokeh. It's a lightweight lens too at 185g on the scales, while at the front it accepts filters with a 58mm thread.

Despite being one of the cheapest Nikkor lenses, the 50mm f/1.8G doesn't scrimp on build quality. It has a metal lens mount that is weather-sealed by a rubber surround covering both the lens and body mounts when the optic is attached to the camera. Sealing the connecting mounts in this way helps to prevent the incursion of moisture and dust. About the only feature lacking is Vibration Reduction, but this is largely unnecessary in a lens of this focal length and with such a large maximum aperture.

With its Silent Wave Motor, the first thing that is apparent when using the lens is how quiet it is. The lens has no difficulty locking onto subjects quickly and it resolves around the same amount of detail as its predecessor, producing

better contrast and less chromatic aberration at wider apertures. Vignetting is present when the lens is used at its widest aperture, but it's not severe and can easily be corrected in software.

With a street price of around £140, it's one of Nikon's cheapest full-frame lenses and regardless of your Nikon DSLR or photographic interests, the 50mm f/1.8G should find a place in most Nikon users' kit bags, especially given its price and the quality of images it produces.

KEY SPECS

FILTER DIAMETER
58mm
CONSTRUCTION
7 elements in 6 groups
DIAPHRAGM BLADES 7
MAXIMUM APERTURE
f/1.8
MINIMUM APERTURE
f/16
MINIMUM FOCUS
45cm
DIMENSIONS
72 x 52.5mm
WEIGHT 185g

PROS

- Fast focusing
- Inexpensive • Compatible with all Nikon DSLRs

CONS

- Vignetting • Curvilinear distortion present

WDC RATING

★★★★★

Camera GOLD



Nikon users will be pushed to find a better inexpensive 50mm prime lens

3 Canon EF 50MM F/1.8 STM £100



Being an EF lens, the EF 50mm f/1.8 STM is fully compatible with both Canon full-frame DSLRs and those that employ an APS-C sensor. Coupled to the latter and with the 1.6x multiplication factor of an APS-C camera taken into consideration, the EF 50mm f/1.8 STM becomes a highly practical and creative short telephoto lens equivalent to 80mm.

Just like previous generations of the lens, it employs a six-elements-in-five-groups arrangement. The main difference in its construction is that it now features seven rounded diaphragm blades, as opposed to the five straight blades

used by its predecessor. The standout feature is the designation of STM on the front of the lens denoting that it uses Canon's Stepper Motor technology. Unlike the more familiar Ultrasonic Motor (USM), a Stepper Motor is better at producing the precise incremental movements which are required by contrast-detection autofocus in live view. This is ideal for creating professional-looking focus transitions when recording video and can also help to eliminate any obtrusive operational noises that can potentially ruin a soundtrack.

Compared to previous versions, this lens is quieter when focusing, however, it's not wholly silent in operation and some low-pitch whirring was traced in indoor movie footage when there wasn't any ambient noise to cancel it out. Although still predominantly made of plastic, the replacement of a plastic lens mount at the rear for a metal one has improved durability, while the plastic used in the construction of the barrel has a much more pleasing matt finish.

When fully opened to f/1.8, images appear perceptibly softer than those taken with the lens stopped down to f/2.8. Closing the aperture from f/1.8 to f/2.8 sees vignetting disperse, and by the time you reach f/4 it's unnoticeable.

Our distortion chart did flag evidence of some barrel distortion towards the corners, but you'll be hard pushed to notice it unless you apply a lens-correction profile and then compare it back and forth with the original.



Users who want to find the sweet spot should use the lens between f/8 and f/11

KEY SPECS

FILTER DIAMETER

49mm

CONSTRUCTION

6 elements in 5 groups

DIAPHRAGM BLADES

7

MAXIMUM APERTURE

f/1.8

MINIMUM APERTURE

f/22

MINIMUM FOCUS

35cm

DIMENSIONS

69.2 x 39.3mm

WEIGHT

160g

PROS

- Quieter autofocus
- Improved build quality and finish
- Lightweight and portable

CONS

- No focus indicator
- Lens hood (ES-68) not included

WDC RATING

★★★★★



2 Sony FE 55MM F/1.8 ZA CARL ZEISS SONNAR T* LENS £799



The Sony FE 55mm f/1.8 was one of the first lenses to be announced when the Sony A7 and A7R arrived on the scene in 2014. Classified as an FE-series lens, it is intended to be used with Sony's full-frame E-mount system cameras, but it's also compatible with Sony APS-C E-mount models. Coupled to a camera that features an APS-C sensor like the A5100 or A6000, it behaves like a short telephoto portrait lens and is

equivalent to 82.5mm in film terms.

Unlike some of the other lenses in this round-up, the FE 55mm f/1.8 isn't a lightweight lens. It measures 71mm long so it's not as compact as you might expect and it weighs 281g on the scales – 120g heavier than the Canon 50mm f/1.8 STM.

The construction of the lens is made up of seven elements in five groups with nine aperture blades. The optical design includes three aspherical elements to minimise chromatic aberrations – something not usually seen on a 50mm prime.

It has an all-metal construction that gives it a solid and robust feel in the hand, which it backs up with seals to keep dust and moisture at bay. The manual focus ring is nice and large and finely grooved, too.

Just as you'd expect from a 50mm lens with such a high price tag and Zeiss branding on the side of the barrel, the FE 55mm f/1.8 delivers absolutely sensational results. Sharpness levels are very impressive wide open and things only get better when you stop the lens down to f/4 and f/5.6.

Distortion and vignetting are very well handled too, but closing the lens down to f/22 sees diffraction take the edge off sharpness.

It's certainly not a cheap 50mm lens and the high price reflects the hard work Sony's engineers have put into creating such a stunning optic. Sony full-frame E-mount users searching for one of the best 50mm lenses to pair with their high resolution cameras will want to add this prime to their wish list – it's quite simply sublime.



The sharpness the FE 55mm f/1.8 resolves wide open is very impressive indeed

KEY SPECS

FILTER DIAMETER

49mm

CONSTRUCTION

7 elements in 5 groups

DIAPHRAGM BLADES

9

MAXIMUM APERTURE

f/1.8

MINIMUM APERTURE

f/22

MINIMUM FOCUS

50cm

DIMENSIONS

64.4 x 70.5mm

WEIGHT

281g

PROS

- Stunning image quality
- Robust build quality
- Dust and moisture resistant

CONS

- Diffraction at f/22
- Expensive

WDC RATING

★★★★★



Sigma

50mm f/1.4 DG HSM A £669



1 50mm lenses don't get much better than this

WWW.SIGMA-IMAGING-UK.COM

When you take the Sigma 50mm f/1.4 DG HSM | A out of the box, the first thing you notice is its weight. As it's a hefty 815g, it is no surprise to find that it is constructed from 13 elements in eight groups. This is an extremely complex arrangement for a 50mm f/1.4 lens. Most other similar optics have six to eight elements, but Sigma clearly has a new-found confidence to manufacture this unique design.

The design of this lens is similar to the 18-35mm f/1.8 zoom lens that we tested last year. It has a large ribbed rubber focus ring that is comfortable to use, even with gloves on. Beneath a small window sits the focus distance scale, while the side of the lens includes an AF/MF switch. This lens is not optically stabilised, which should be a consideration if you have difficulty holding heavier lenses steady.

Overall, the build of the Sigma 50mm DC HSM f/1.4 lens is superb, if a little heavy, and it is amazing how a simple redesign of the body can elevate a brand to premium status, without an inflated price tag. One of the first things you'll notice when using the lens is how quiet it is. The Hyper Sonic Motor (HSM) is fast and quiet, and it helps that just a quarter turn of the focus ring moves the lens from its 40cm minimum focus distance to infinity.

Once focused, the lens holds firm and doesn't slip, requiring a quite definite turn to shift it from position.

With a 40cm minimum focus distance, the Sigma 50mm f/1.4 lens provides a magnification of 1:5.6, which is respectable for a lens of this type; just don't expect to take too many close-up images with it.

When shooting at f/1.4, the light

passing through the lens is obviously unobstructed by the lens aperture. But with nine aperture blades producing an almost perfect circle, even stopping the lens down to f/2.8 and smaller produces smooth out-of-focus backgrounds.

Put the Sigma 50mm f/1.4 DG HSM | A on a camera with an APS-C-sized sensor and it becomes a 75mm f/1.4 lens, which is great for portraiture. At f/1.4, the lens obviously isn't at its sharpest, but for portraits this can be quite flattering, with enough sharp detail in the subject's eyes, but with the shallow depth of field and the lens not being at its sharpest giving a slightly more flattering look to skin.

With a street price of around £669, the Sigma 50mm f/1.4 DG HSM | A isn't cheap, with most comparable lenses costing around £500. However, the reason for the extra cost is quite clear: this lens features a unique design that breaks away from the traditional configuration of a 50mm f/1.4 lens – a bold move that pays off in terms of the quality of its results.



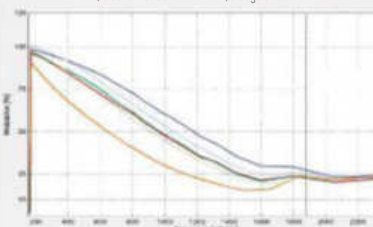
Even though the lens isn't at its sharpest at f/1.4, it can still resolve excellent detail wide open

Lab Tests

RESOLUTION

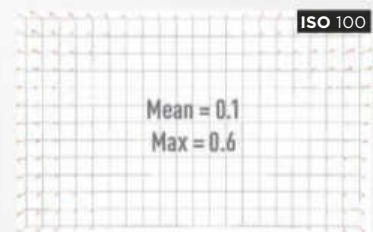
The lens performs at its best at f/5.6-8. It also manages to resolve quite a staggering amount of detail in images at the corners of the frame.

f/8 centre at 16mm f/8 edge at 16mm
f/8 centre at 28mm f/8 edge at 28mm
f/8 centre at 35mm f/8 edge at 35mm



CURVILINEAR DISTORTION

The distortion graph shows slight pincushion distortion, whereas most 50mm lenses suffer from barrel distortion. However, it is minimal.



KEY SPECS

MAXIMUM APERTURE
f/1.4
MINIMUM APERTURE
f/16
LENS MOUNT
Canon, Nikon, Sigma
LENS ELEMENTS
8
LENS GROUPS
6
APERTURE BLADES
9
FILTER THREAD
77mm
SIZE
84.5x68.2mm
WEIGHT
520g

PROS

- Superb image quality
- Impressive bokeh
- Various mounts available
- Full-frame and APS-C compatible

CONS

- Rather heavy
- Larger than many other 50mm lenses
- Expensive

WDC RATING



Win



Win a Lastolite Lumen8 Kit

A Lumen8 Kit F400 plus two stands and two umbrellas worth £525.95 is up for grabs!

Want to improve your images? Lastolite's Lumen8 flash range has been designed to fulfil the needs of the most demanding working photographers. The range has been developed to a high specification offering reliability, durability and safety on location or in the studio.

The Lumen8 LL LL3502RT lighting kit, part of the Lumen8 flash range, is designed for photographers who need to be mobile. It contains everything you need to light a subject at home, in the studio or on location. The Lumen8 SV twin 400w head lighting kit offers full control of the power output over five stops in 1/10th steps. This versatile kit can be put to a variety of uses, from close-up product shots to family portraits.

Included in the kit are two Lumen8 F400 flash heads, two 18.5cm reflectors, two light stands, two PVC 80cm umbrellas, two sync cables and two carry cases to transport everything either by hand or shoulder. For your chance to win, simply enter online.



Answer this question:

How many Lumen8 400 flash heads are included in the kit?

Closing date: 25 September 2015

For more details about this prize, visit www.lastolite.co.uk



TO ENTER, VISIT
whatdigitalcamera.com/octcomp

Just for Fun

Test your photo knowledge and have some fun with the all-new **What Digital Camera** brainteasers below

V	D	S	H	W	A	Y	L	E	P	X	O
O	M	T	U	O	N	B	M	N	C	Y	E
B	R	H	P	D	O	J	H	L	M	J	J
T	A	G	F	N	D	Z	X	A	X	X	V
Z	I	I	O	I	A	U	G	R	S	C	O
A	R	L	R	W	G	I	H	G	D	U	N
G	V	H	Q	R	L	K	B	E	P	O	O
O	O	G	E	A	A	O	H	R	W	E	N
P	J	I	I	E	S	R	X	G	A	F	A
R	B	H	M	R	G	C	F	G	L	D	C
O	X	M	A	R	G	A	T	S	N	I	Y
T	R	E	T	L	I	F	W	V	D	D	G

* Straight lines: forwards, backwards, up, down or diagonally

Quiz and wordsearch

Decipher the clues and then find the answers hidden above!

- 1 Circular or square piece of glass or resin placed in front of the lens.
- 2 Small video camera often worn by extreme sports enthusiasts.
- 3 In a traditional darkroom, the device used to project the negative onto the paper.
- 4 Photographer famous for documenting the American Civil War.
- 5 In the US, which company uses the 'Rebel' brand name for its entry level DSLRs?
- 6 Hitchcock movie about a wheelchair-bound photographer.
- 7 What is the brand name used by Olympus on its lenses?
- 8 Mobile photo-sharing, social media service famous for its square pictures and filter effects.
- 9 The brightest parts of an image.
- 10 Brazilian photojournalist whose major works include *Workers*, *Migrations* and *Genesis*.

Guess the mystery camera!

Do you recognise either of these popular cameras?



LAST MONTH'S ANSWERS: 1 Pixels 2 Stieglitz 3 Rolleiflex 4 Cameron 5 Panoramica 6 Leibovitz 7 Gandolfi 8 Daguerre 9 HDR 10 Waite. **Mystery cameras:** Sigma SA-1, Olympus E-1

Don't forget to buy next month's issue to find out all the answers.

3 Legged Thing EV03 Punks Rick £199

WWW.3LEGGEDTHING.COM

3 Legged Thing is a company known for its quirky product names and the latest addition to the Evolution 3 range is Rick – a carbon-fibre travel tripod designed for those looking for a compact and lightweight tripod to support a small DSLR or CSC. Thanks to its removable and reversible centre column, it's a set of sticks that will allow those who like to work from low angles to do so easily. The legs can be set to 23°, 55° or 80°, and the quick-release plate that connects to the supplied AirHed Mohawk ball head is compatible with Peak Design camera clips, so users can connect a camera to a strap or belt without attaching a separate plate. The new parallel twist-type leg locks unscrew by half a turn to save time extending and tightening the legs.

Once it was out of its canvas carry case, I managed to extend the tripod fully

to its maximum 140.6cm working height in just under 40 seconds. Fully extended, the legs did show signs of flexing when serious force was applied, but the locks refuse to slip provided they're fully tightened. The detachable monopod is an attractive feature, but on a tripod of this size it's very small and won't see regular use unless you're happy to crouch or use it when sitting.

Although it's hard to fault the finish, the bronze, orange and blue colours won't be to everyone's liking, and I would have preferred the smaller locking knobs on the ball head to be rubberised to enhance the grip and improve operation. As travel tripods go, it's light and folds down to a practical size, but if you're prepared to settle on an aluminium alternative there are great travel tripod options available at half the price. **MT**

Quick release

The square quick-release plate is compatible with Peak Design capture clips and is Arca Swiss compatible.

Monopod

This orange anodised ring indicates the leg that can be unscrewed and used as a monopod.

Weight

The carbon-fibre legs ensure this is a lightweight set of sticks. On the scales it weighs 1.1kg.

Parallel locks

The TPR 80 parallel locks ensure that the leg locks don't totally unscrew.

PROS

- Small and light
- Easy to work at low angles

CONS

- Locking knobs could be rubberised



“Thanks to its removable and reversible centre column, the tripod will allow users to work from low angles easily”

ZKIN MAYURA PROTECTIVE WRAPPER £25

WWW.Z-KIN.COM

This wrapper provides good padding when a camera or lens is wrapped inside it. It features a teal-coloured microfibre inner with illustrations towards its top. The outside is made of a soft burgundy material that allows the Velcro corners to stick to it when wrapping up kit. There are also leather accents on the corner of the Velcro tabs. It can fit a medium DSLR, a large prime lens or a Micro Four Thirds camera. I tried it with a Canon EF 24-70mm f/2.8L II lens, which fits perfectly, as did an Olympus OM-D E-M5 Mk II. I've not seen a better quality lens wrap. **CMR**



RE-FUEL BY DIGIPOWER RECHARGEABLE POWER BANK £32

WWW.DIGIPOWERSOLUTIONS.COM

Handy for charging your mobile on the go, the Re-fuel power bank has a 5200mAh capacity and a 1A (5V) output rating. With one USB port at one end and a Micro USB input port for charging purposes, it has a curved design and is finished with lime-coloured ends. On the top surface there's a single button to start charging and check the remaining power of the lithium polymer battery, which is indicated by four tiny bright-white LEDs. I used the supplied Micro USB cable to fully charge it before testing it. Charging times are fairly brisk and it increased my iPhone's battery life from 2% to 50% in just over an hour with power to spare. **MT**



Ansmann Powerline Vario £30

WWW.ANSMANN.DE/EN

Ansmann sells standard-sized batteries and replacement power packs for cameras. The Powerline Vario is a universal charger that's designed to recharge either a pair of AA or AAA cells, or almost any 3.6V or 7.2V Li-ion power pack using a pair of prongs that slide to align with the battery's contacts. Many similar devices exist, but the Ansmann stands out due to its neat, compact design and the fact that the charger unit works via a Micro USB input. This means that not only can it work off mains power or in the car, but it can recharge batteries using a generic USB charger, a powered USB socket on a computer or a portable power bank.

The charge status is shown using a four-stage LCD display, with a slightly cheaper model, the Photocam Vario, differing only

in that it has a simplified LED-based display. Four interchangeable plugs are supplied for the mains adapter, allowing use in the UK, EU, North America and Australia. With a 1A USB output, this can also charge other USB devices, like smartphones or 7in tablets.

I have been using this charger for a couple of months to top up the batteries of the various cameras I've been testing. On the whole it works very well with most batteries, although there are a few exceptions – notably the Olympus BLN-1 used by most OM-D cameras and the Canon LPE-6 for many EOS DSLRs. However, for the batteries it does work with this is a versatile, reliable charging system that's perfect for travel. **AW**

PROS

- Versatile charging
- Compact design

CONS

- Doesn't work with every single battery



Vanguard Divider Bag 40 £50

WWW.VANGUARDWORLD.CO.UK

The Vanguard Divider Bag series has a total of four cases, which range from the smallest, Divider Bag 37, to the largest, Bag 52. The Divider Bag 40 sits in the middle of the range and has a number of inner dividers that can be repositioned to suit the kit you carry. With the ability to hold two DSLRs with grips and attached lenses, up to six extra lenses, a flash unit and accessories, its storage capacity is impressive – all the more so when you consider it weighs just 900g when empty. It comes just with a carry handle on top and no shoulder straps, because Vanguard has designed the Divider Bag range primarily as storage and organisation cases, and not as backpacks

or carrier bags. The range is still great for keeping all your kit in one place – whether in the studio, at home or in the car for a big shoot. It's also possible to fit it inside a Vanguard hard case and our Divider 40 fitted snugly inside the Vanguard Supreme 40F waterproof and airtight hard case (£130). If you have multiple kits, using the Divider 40 to store each set, then swapping it in and out of a hard case, is an alternative to unpacking and repacking.

The build quality is good, there's plenty of thick, soft padding to protect your gear and it has a couple of extra zippered pockets. For photographers looking to streamline their storage, it's a great investment. **CMR**

PROS

- Build • Great for keeping your kit in one place

CONS

- Not designed for travelling





The EOS 760D uses Canon's latest 24MP APS-C sensor



CANON EOS 760D £649 BODY ONLY

Is the EOS 760D the best choice for aspiring enthusiast photographers?

WWW.CANON.CO.UK • TESTED BY MICHAEL TOPHAM

When the EOS 760D was announced, we were left scratching our heads. Why were the EOS 750D and 760D – featuring the same specs – outed at the same time? The appeal of the EOS 760D is that it offers a control layout that feels similar to a high-end camera and it is aimed at enthusiasts who are much surer of what they want.

One of the key improvements is an increase in the sensor resolution from 18MP to 24MP. It features the latest DIGIC 6 image processor and can shoot a continuous burst at up to 5fps – the same speed offered by one of its rivals – the Nikon D5500.

The autofocus has been given an upgrade and sees an increase from a nine-point AF system to a 19-point offering. All 19 are cross-type points, too, making them faster and more accurate. You're not left with pure contrast detection as soon as you switch to Live View either. It uses a hybrid CMOS AF III system that has phase-detection points on the chip, which ultimately leads to a sprightly focus speed in live view when you're shooting stills or video.

At the rear, the optical viewfinder reveals 95% coverage of the frame and unlike the 750D, an electronic level icon can be switched on within the menu to ensure horizons aren't captured askew. Canon has opted to keep the same 3in touch-sensitive Clear View II TFT screen that impressed us on the 700D and this is also featured on the 750D.

The mode dial sits on the left side

rather than the right (from your shooting position), and there's a top-plate LCD panel from which you can view vital information such as shooting settings, battery level and how many shots fit on the SD card.

To select shooting settings, you use the two manual dials. One sits just behind the shutter button, and the other is found on the d-pad. It offers plenty of control, although higher-end Canon models such as the EOS 7D Mk II use dials that are larger and offer greater resistance.

Whereas the skeleton of the body is made from aluminium, the outer parts of the camera are made up of plastic and carbon fibre. It is quite a rugged camera, though it doesn't have the same weather-sealing characteristics as the Pentax K-S2.

The 760D produces stunning images with the right lens, helped by the new 7,560-point metering system. The APS-C sensor produces good results up to ISO 3200, giving you a decent amount of flexibility to shoot handheld at dusk and still end up with fair results. Our dynamic range results revealed it's no match for the Nikon D5500 or Pentax K-S2 in this criteria. As for noise, it's only when you move up to ISO 800 that the first traces of luminance noise becomes apparent. It's by no means offensive at this setting though and ISO 6400 is usable with a push. The noise reduction that's applied to JPEGs has an impact on the level of detail captured beyond ISO 3200 in low-light scenes so we'd always recommend shooting in Raw.

KEY SPECS

SENSOR 24.2MP APS-C-sized CMOS sensor
LENS MOUNT Canon EF
FILE FORMAT JPEG, Raw, JPEG + Raw
DISPLAY 3in, 1,040k-dot vari-angle touchscreen
SHUTTER SPEEDS 30secs-1/4000sec
ISO 100-12,800 (expandable to ISO 25,600)
EXPOSURE MODES PASM, Scene Intelligent Auto, Creative Auto, Scene
EXPOSURE COMP +/-5EV in 1/3EV or 1/2EV steps
BURST 5fps
MOVIE 1920 x 1080 pixels @ 30, 25, 24fps
DIMENSIONS 131.9 x 100.9 x 77.8mm
WEIGHT 565g (body only)

Verdict

For aspiring enthusiasts, the 760D ticks all the right boxes and is a more than capable DSLR. Anyone sitting on the fence pondering whether to buy the 750D or 760D will want to consider the differences carefully, but if you know you have a passion for photography, the 760D is the DSLR that'll ultimately serve you better in the long term. Canon has been successful in creating its best three-digit DSLR to date.

BEST FOR

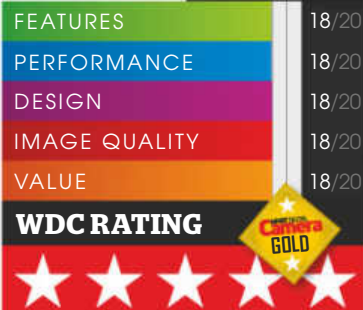
• Aspiring enthusiasts wanting an LCD on the top-plate and a thumbwheel at the rear • Producing prints up to A2 size • Wireless remote shooting

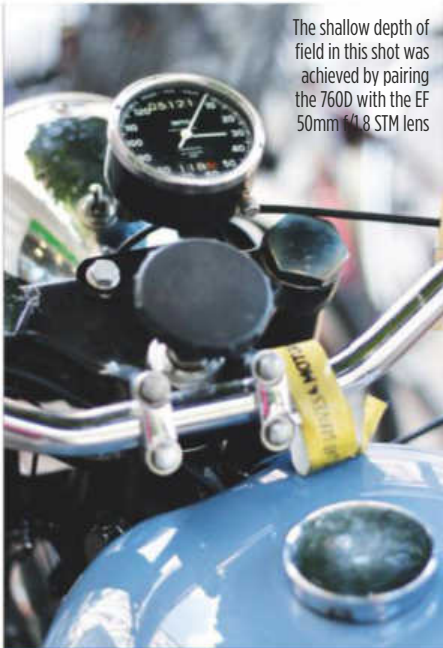
PROS

- 19 all cross-type AF points for accurate subject tracking
- Wi-fi and NFC connectivity for easy sharing and transfer
- Extremely responsive 3in, 1,040k-dot vari-angle touchscreen

CONS

- Viewfinder doesn't provide 100% frame coverage
- Doesn't accept the 700D's LP-E8 battery
- No weather sealing
- Fitted with an anti-aliasing filter





The shallow depth of field in this shot was achieved by pairing the 760D with the EF 50mm f/1.8 STM lens



Users can shoot black and white images in-camera using the Monochrome picture style mode



Rich and vibrant colours are a trademark of Canon DSLRs and the EOS 760D is no exception



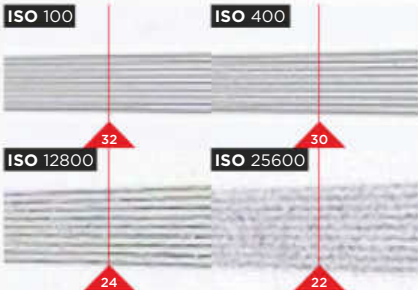
This image, shot at ISO 6400, illustrates how well the 24MP sensor performs in low-light situations

Image quality



COLOUR

Canon DSLRs have a reputation for producing punchy colours and the EOS 760D is no different. Our test images displayed vivid and faithful colour tones, accurate to the scene as viewed by our eyes.



RESOLUTION

The 760D produces an identical level of detail to the 750D. At its base sensitivity the 24MP sensor resolves 3200 l/ph. Users can expect the level of detail to drop gradually as the sensitivity is increased.

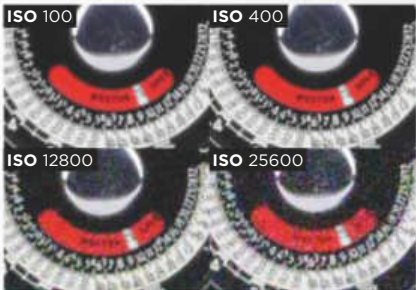


IMAGE NOISE

Acceptable results can be obtained at ISO 6400 provided that some noise reduction is applied in post and images aren't printed too large. Pushing up to ISO 12,800 and 25,600 introduces obvious chroma noise.



PANASONIC Lumix DMC-GX8 £1000

The Panasonic GX8 is the highest resolution Micro Four Thirds camera yet
WWW.PANASONIC.COM • TESTED BY ANDY WESTLAKE

Panasonic has been manufacturing mirrorless compact system cameras longer than any other maker, and now offers models at a wide range of sizes and price points. The GX8 sits towards the top of the range, between the video-focused GH4 and the enthusiast-oriented G7. Replacing the GX7, it features weatherproof construction, in-body image stabilisation, a high-quality tilting electronic viewfinder and a fully articulated OLED touchscreen.

The GX8 is the first Micro Four Thirds camera to feature a 20MP sensor, and this brings a small but welcome improvement in image quality compared to existing 16MP models, at least for Raw shooters. It gives clean, detailed images at low ISOs, and is still quite usable at ISO 3200. But higher settings are increasingly affected by noise, with the top ISO 12,800 and 25,600 settings barely usable. The JPEG output isn't quite as appealing as some of its competitors either, with auto white balance often introducing a cool cast to images.

Both the viewfinder and screen are excellent. The large 2.36m-dot OLED EVF is as large and clear as any CSC's, and unusually tilts 90° upwards for low-angle shooting. The rear OLED screen is fully articulated, which encourages shooting at unusual angles. Both give an accurate impression of the final image.

With its large chunky body and prominent grip, the GX8 fits nicely

in your hand for extended shooting sessions. It's covered in buttons and dials, which, combined with the responsive touchscreen, make changing settings very quick and easy. Most of the control setup is customisable, the only problem then being remembering what all of the buttons do, as many are unmarked.

In typical Panasonic fashion, the GX8 is very snappy in operation, with fast focusing and a responsive shutter. It can shoot up to 8fps, with a generous 30-frame buffer for Raw shooting. It can also record high-resolution 4K video, and includes Panasonic's 4K Photo mode that allows easy extraction of 8MP JPEG stills from 30fps video footage. Lots of video-friendly features are on offer, including a 2.5mm stereo mic socket, but no headphone output for monitoring sound. Naturally the GX8 comes with built-in Wi-fi for connection to a smartphone for remote control and sharing images.

A key feature of the GX8 is that it includes in-body image stabilisation. This works with all lenses, most notably Olympus's Micro Four Thirds optics, and offers four-axis correction to give better results for handheld close-up shooting. It can also combine with the optical stabilisation in many of Panasonic's lenses to give an increased overall effect. I found that it works well in real-world use, and is a close match to Olympus's superb five-axis stabilisation found in the Olympus OM-D E-M5 II.

KEY SPECS

SENSOR
20.3MP Live MOS sensor
LENS MOUNT
Micro Four Thirds
LCD
3in, 1.04-million-dot OLED fully-articulating touchscreen
FILE FORMATS
JPEG, Raw (RW2), JPEG+Raw
EXPOSURE MODES
PASM, auto, panorama
METERING SYSTEM
Multi, spot, average
ISO RANGE
100-25,600 (extended)
WHITE BALANCE
Auto, Daylight, Cloudy, Shade, Incandescent, Flash, Custom x4, Kelvin
MEMORY CARD
SD, SDHC, SDXC

Verdict

The GX8 is a very capable high-end CSC, providing an interesting alternative to cameras like the Fujifilm X-T1 and the Olympus OM-D E-M5 II, especially if you're interested in 4K video or Panasonic's related 4K Photo mode for capturing fast action. It's a bit bulky compared to many other CSCs, but it handles well, with lots of external controls and stacks of user customisation, and it can deliver excellent images, especially if you shoot in Raw.

BEST FOR

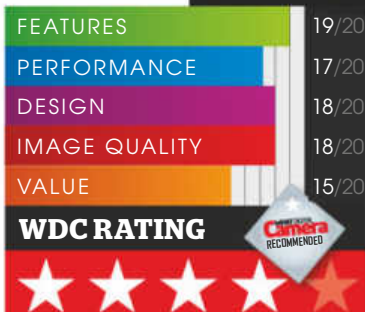
- Photographers who also like to record high-quality video
- Shooting at unusual angles

PROS

- Top-notch viewfinder and screen
- Excellent handling
- Impressive continuous shooting

CONS

- Bulky for Micro Four Thirds
- Uninspiring JPEG colour



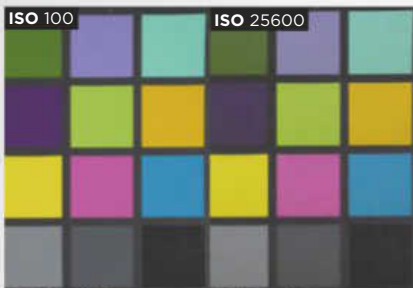
The GX8's 20MP sensor can record lots of detail

Panasonic's JPEG colour rendition isn't quite as appealing as some competitors

Image stabilisation allows use of slow shutter speeds handheld – here 0.3sec

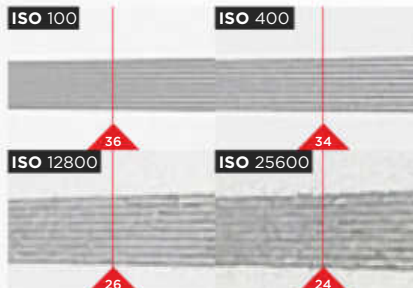
The GX8 is well-matched to high quality lenses like the 12-35mm f/2.8

Image quality



COLOUR

The GX8 gives JPEG colour output that, while technically pretty accurate, tends to be uninspiring in normal use. The camera's high ISO processing aims to retain colour saturation at the expense of fine detail.



RESOLUTION

With 3600 l/ph at ISO 100, the GX8 delivers on its promise of recording more detail than its 16MP Micro Four Thirds peers. Resolution inevitably drops with increasing noise at high sensitivities.

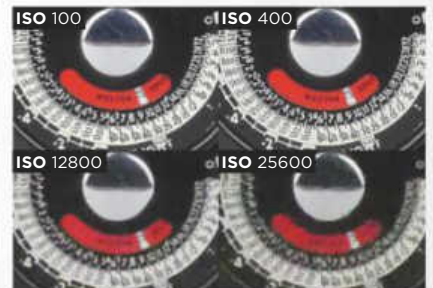


IMAGE NOISE

At ISO 100-400, the GX8 delivers clean, detailed images with little perceptible noise. At higher settings, noise increases at the expense of fine detail, but the camera still gives good results up to ISO 3200 at least.



A rubber grip accessory (AG-R2) is available, priced £15



SONY DSC-RX100 IV £849

The RX100 IV compact promises to be even faster than its predecessor
WWW.SONY.CO.UK • TESTED BY MICHAEL TOPHAM

Every year since 2012, Sony has taken its advanced point-and-shoot compact camera and improved it. The new RX100 IV arrives with yet more attractive features and improvements to ensure it's right up there as one of the very best pocket-sized compact cameras.

For the past two generations, Sony has rolled out the RX100 II and the RX100 III with a 20.1MP Exmor R BSI-CMOS sensor. Although the resolution remains the same on the RX100 IV, the configuration of the sensor is different, incorporating a stacked design that repositions the circuitry from the edges of the sensor to behind the pixels themselves. This results in a data readout speed that Sony claims to be five times faster than the existing Exmor R sensor, and allows the RX100 IV to rattle off a continuous burst at up to 16fps. It can also shoot up to 1/32,000sec.

However, the new sensor and speed benefits don't end there. Slow-motion video recording is possible at an incredible 1,000fps and 4K video recording is available with full-sensor readout and bit rates up to 100Mbps, but you'll need a UHS-I U3-compatible card. Like the RX100 III, the native sensitivity range is ISO 125-12,800, with the option to expand it to ISO 80 and ISO 100 at the low end.

The RX100 IV retains the f/1.8-2.8 (24-70mm equivalent) Zeiss Vario-Sonnar T* lens, built-in ND filter, Wi-fi, NFC connectivity and

a 3in, 1.23-million-dot articulated screen at the rear. The pop-up EVF sees a jump in resolution to 2.36 million dots from 1.44 million dots.

Flicking the finder switch fires the camera into life. Holding the EVF up to the eye presents a clearer and sharper view than the RX100 III, and in high-contrast conditions – where reflections on the screen can hinder composition and make it difficult to review images – it's a godsend.

It's easy to change the exposure settings via the rear control dial, and a quick press of the Fn button reveals an on-screen menu for the most common shooting, image and exposure settings. The addition of a second control ring around the lens offers dual control of shutter speed and aperture in manual mode, while it can be used to control ISO, white balance and exposure compensation.

The RX100 IV's focusing is comparable to the RX100 III and the contrast-detection system is hasty by compact camera standards. There's focus tracking and face detection, but no touchscreen.

In our test, the RX100 IV rattled out 44 extra-fine JPEGs at 16fps. Switching the file format to Raw lowers the burst speed to 9fps, and 29 images were recorded at this speed before the buffer kicked in.

I tested the new high frame rate (HFR) feature and it's a fascinating experience creating slow-motion videos at up to 1,000fps. To give you an idea of just how slow it is, one second of real-time footage is slowed down to about 40 seconds.

KEY SPECS

SENSOR
1in, 20.1MP Exmor RS CMOS sensor
FILE FORMATS
JPEG, Raw
DISPLAY
3in tilting LCD with 1.23million dots
ISO RANGE
125-12,800 (expandable to ISO 80/100)
EXPOSURE MODES
PASM, Intelligent Auto/Superior Auto, MR (Memory Recall) 1,2,3, HFR Mode, Panorama, Scene
BURST
16fps continuous shooting
MOVIE MODE
4K (3840 x 2160) and full HD (1920 x 1080)
DIMENSIONS
101.6 x 58.1 x 41mm
WEIGHT
298g (with battery and card)

Verdict

The improvements made to the Sony Cyber-shot DSC-RX100 IV allow it to shoot faster and offer new video capabilities. The overall performance and image quality are very impressive for a camera so small, although our test results show it doesn't offer any advantages in these areas over its predecessor. Another feature that proved its worth in the field was the built-in ND filter, which is ideal for creating long exposures of up to three stops slower.

BEST FOR

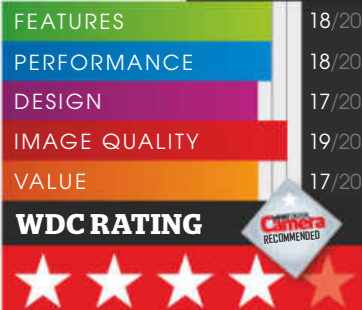
• Photographers looking for one of the best pocket-sized compacts • Those who want Raw control • Image quality • 4K video recording

PROS

- Impressive resolution for a camera so small
- Advanced video capabilities
- 16fps continuous shooting
- Excellent EVF
- Slow-motion modes

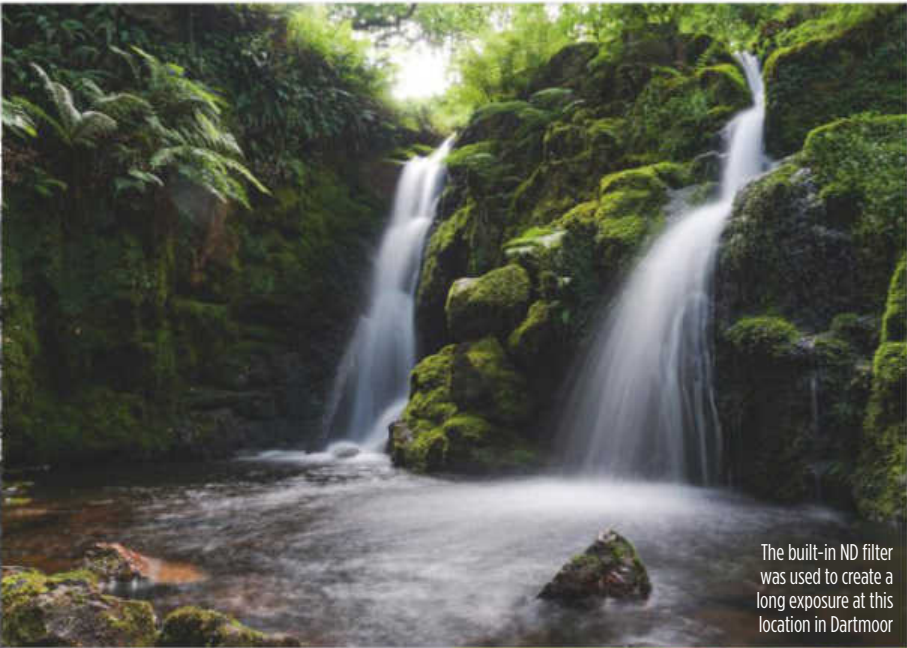
CONS

- Reduced battery life (280 shots)
- No rubberised handgrip
- No touchscreen functionality





The RX100 IV's black and white creative style mode was used to capture this shot



The built-in ND filter was used to create a long exposure at this location in Dartmoor



The zoom speed can be adjusted. Set to fast, it takes 1.8secs to go from the wide end to full telephoto



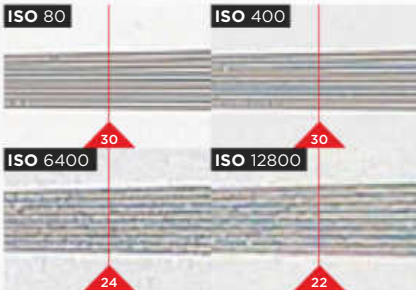
It's possible to focus within 5cm of a subject when the zoom is set to its widest setting.

Image quality



COLOUR

Rich, vibrant and colourful images are produced by the RX100 IV. The camera was set to auto white balance for most of our testing and as our test images above show, the neutral results resemble scenes faithfully.



RESOLUTION

For such a small camera, the RX100 IV resolves superb detail from its 1in sensor. Set to ISO 100 the sensor resolved around 3,000 l/ph, dropping to 2,200 l/ph when it was pushed to its ISO ceiling (ISO 12,800).

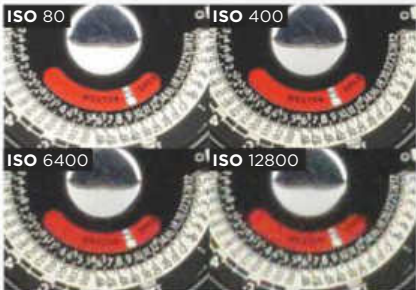


IMAGE NOISE

Luminance noise starts to creep in at ISO 1600. Detail holds up very well at ISO 3200 and although finer details aren't as well resolved at ISO 6400, you achieve a usable result at this setting in an emergency.

Fujifilm

Fujinon XF16mm f/1.4 R WR £729

With its 24mm-equivalent view, the 16mm is great for scenic shots



Andy Westlake tries out this weather-sealed fast prime lens for X-system users

WWW.FUJIFILM.COM • TESTED BY ANDY WESTLAKE

The 16mm f/1.4 is the latest X-series lens for Fuji's compact system cameras. With an angle of view equivalent to that of a 24mm lens on full-frame, this lens offers a wideangle perspective that should interest landscape and architectural photographers. The impressively fast maximum aperture is appealing for hand-held low-light work, allowing the use of lower ISOs than would otherwise be possible. It also gives potential for selective focus effects, giving a depth of field roughly equivalent to that of an f/2 lens on full-frame. This combination of wide angle and fast aperture is currently unique for a CSC lens.

Features

The XF16mm f/1.4 R WR has 13 elements in 11 groups, including two aspherical elements and two extra-low dispersion (ED) glass elements, which together are designed to minimise distortion and chromatic aberration. Fujifilm's Nano GI coating is applied to the inside surface of the front element

to combat flare and ghosting, along with HT-EBC (high transmittance electron beam coating) on other glass surfaces.

The 'R' in the lens name denotes that the lens includes an aperture ring. This has markings from f/1.4 to f/16 in full stop increments, and click stops at intermediate one-third stop steps. An 'A' position passes aperture control to the camera's automated systems in 'program' or 'shutter priority' mode.

Weather resistance is featured for the first time on a Fujifilm prime lens



With the large focus ring in its forward position, the lens is in autofocus mode and the focus ring is locked from moving. Pull the ring back towards the camera and it engages manual focus, exposing a distance scale in the process. There's also a depth-of-field scale on the barrel, but its markings are so closely spaced that it's of little practical use. A floating focus system is employed to maintain good image quality through the full focal range.

For the first time on a Fujifilm prime lens, the 'WR' suffix is used, denoting weather resistance. The lens has nine seals to protect against dust and water, including one around the bayonet mount. The lens is also freeze-proof and usable down to -10°C at least.

Filters can be attached using 67mm thread; this does not rotate on focusing, making it easy to use with polarisers and neutral density graduated filters that are popular for landscape photography. A bayonet-fit, plastic petal-type lens hood comes as standard and can

be stored in the reverse position when not in use. An optional cylindrical metal hood with a rectangular baffled cut-out, the LH-X16, is due to appear in September 2015.

Build and handling

With its predominantly metal-barrelled construction, the 16mm feels like a top quality piece of kit. Most of the barrel is taken up by the broad focus ring and the slimmer aperture ring, which are separated by a prominent fixed section that provides a positive grip when changing lenses.

The manual focus ring is one of the better examples of its type, driving manual focus electronically while giving a reasonably good impression of a traditional mechanical design. It rotates smoothly between its infinity and minimum focus end stops, engaging your chosen focus aid in the process. However, the aperture ring has extremely loose click stops, making it easy to move inadvertently. Though you can always see the current aperture setting in the viewfinder, I'd prefer more positive click stops.

X-Pro1 users should note that the 16mm will protrude a huge amount into the lower right area of the optical viewfinder, especially with a hood attached. As with the 14mm f/2.8 and the 10-24mm f/4 zoom, it's best to use the electronic viewfinder so you can see the entire scene.

Autofocus

The autofocus is more than capable for the kinds of subjects it's most likely to be used for. Likewise, while the linear motors used in the company's top-end zoom lenses are practically inaudible, the 16mm's AF is merely very quiet indeed. However, only the photographer is likely to be able to hear it and when paired with the silent electronic shutter on the X-T1 and X-T10, it should be possible to shoot in quiet environments with impunity.

In terms of accuracy, as we've come to expect from mirrorless systems that determine correct focus using the main imaging sensor, there's absolutely nothing to complain about. The only caveat is that it's necessary to ensure that the AF area is aligned exactly with your desired point of focus. When shooting wide open, I also found

that it pays to select the smallest AF area the camera will use, in order to achieve the best possible precision.

One useful trick is that if the lens's focus ring is pulled forwards but the camera's focus mode switch is set to manual, autofocus can then be acquired using the AFL button. This can be helpful when you wish to prefocus on your subject and minimise any possible shutter lag.

Image quality

The XF 16mm f/1.4 R WR gives impressively sharp images. The extreme edges and corners are a little soft at large apertures, but this is likely only to be visible in relatively large prints (12x16in or A3+), and even then shouldn't detract from a strong subject. Stop down to normal working apertures of f/5.6-f/8, and the lens is critically sharp across the frame.

Vignetting is low and compensated by Fujifilm in JPEG processing. Distortion is practically invisible, and

unlike many other CSC lenses, this is achieved by optical correction only, rather than software correction. Colour fringing in the corners of the frame due to lateral chromatic aberration is extremely low, but some blue or purple fringing can be seen around very high-contrast edges (for example, window frames when shooting interiors) while working at large apertures.

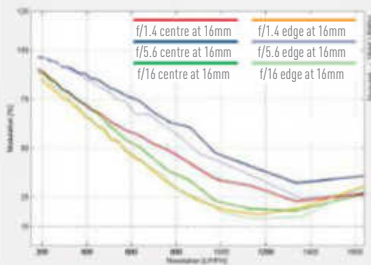
If the lens has a weak point, it's flare when shooting with the sun in, or just outside, the frame. At large apertures veiling flare can reduce contrast nearby, and at small apertures strong multi-coloured patterns can start to appear. Such problems can usually be seen in the viewfinder before shooting, but there's little you can do about them.

When working at large apertures, the lens generally renders defocused backgrounds quite smoothly and attractively, which is a very welcome trait for certain types of photography such as environmental portraiture.

Lab Tests

RESOLUTION

Sharpness is very good in the centre of the image wide open, and if you stop down to just f/2.8, the corners match the centre. Our MTF figures then barely change before diffraction sets in at f/11.



CURVILINEAR DISTORTION

The 16mm is highly optically corrected and very little distortion can be seen, even when files are examined using a raw converter like Capture One for which all software correction can be disabled.



KEY SPECS

FILTER DIAMETER 67mm
LENS ELEMENTS 13
GROUPS 11
DIAPHRAGM
BLADES 9
APERTURE f/1.4-16
MINIMUM FOCUS 15cm
LENGTH 73mm
DIAMETER 73.4mm
WEIGHT 375g
LENS MOUNT Fujifilm X

PROS

- Outstandingly sharp images • Fast maximum aperture
- Fast, quiet and accurate autofocus
- Build quality

CONS

- Lens flare if the sun is in the frame or just outside it
- Edge fringing when using wide apertures

WDC RATING



Compact or System camera?

Which camera type is best for you? A simple compact that fits in a pocket, a premium or travel compact that's more advanced, or a system camera that has interchangeable lenses and more user control, such as a CSC or DSLR? We help you decide...

All digital cameras are based around the same theory; use a light-sensitive sensor to capture light, then process the result and save it onto a memory card. Beyond that, the functionality can vary wildly from model to model, from touchscreen controls to HD video and wide-aperture lenses differentiating one model from another.

Digital cameras fit into three distinct categories: compact camera, Compact System Camera (CSC) and Digital Single Lens Reflex (DSLR) cameras. All three have sub-genres within them, but there are other obvious qualities which set them apart.

Compact cameras have a fixed lens, which can't be removed and changed. This means that the lens becomes a feature in itself, with some of them starting at a particularly wide focal length, or reaching out much further than others (or both), and others having

wide maximum apertures which prove their worth in low light and for controlling depth of field.

Manual controls, the ability to record HD video and a large, high-resolution display or viewfinder are just a few of

many other features that can be had when more money is spent.

Within the compact camera genre are the likes of bridge, or 'superzoom' models, which offer a far longer zoom lens and a body shape akin to that

of a DSLR, together with manual control over shutter speed and aperture. While they can be used more creatively than regular compacts, their small sensors (relative to DSLR and CSC cameras) place restrictions on

Compact

Small camera, generally pocket sized, with non-removable zoom lenses. Designed for convenience more than image quality, though some premium models feature larger sensors and manual controls.



PROS

Small, Affordable, No additional lenses required, Pocketable, Less intimidating to use than DSLRs

CONS

No option to change lenses for specific purposes, Small sensors not suited to all conditions

Bridge camera

Looks like a DSLR but is actually a compact with a high-magnification zoom lens in a DSLR-shaped body – usually incorporating a large hand-grip and often a viewfinder.



PROS

Long zooms, All-in-one design, Manual controls

CONS

Generally small sensors are no match to DSLR quality, Build quality can be more plasticky than a DSLR

Jargon Buster

Compact System Camera (CSC)

Cameras which offer interchangeable lenses while omitting the viewfinder and mirror box construction common to DSLR cameras. These include Sony's NEX series and Olympus's PEN range, as well as Nikon's 1 system and Samsung's NX line of models.

Digital Single Lens Reflex (DSLR)

A digital SLR camera, which is constructed around a mirror-box and pentamirror/pentaprism assembly, such as the Canon EOS 700D and Nikon D5300. These are popular among beginners, enthusiasts and

professionals, thanks to their wide compatibility with different lenses, manual control over exposure and ergonomics.

Compact camera

A small camera whose lens cannot be removed, in contrast to interchangeable-lens cameras such as DSLRs. These are often cheaper than CSC and DSLR cameras, although they usually have more limited functionality and smaller sensors.

Aperture

The aperture of a lens refers to the size of its opening which allows light through to the camera. This is created by a series of

blades inside the optic, and is usually regulated through the camera body, although some older lenses have physical aperture rings around their barrels. An aperture of f/2 or f/2.8 is classed as being large (or wide) because the opening itself is larger than those created by higher-number apertures such as f/16 or f/22.

Shutter speed

The length of time that the shutter inside the camera is open, exposing the sensor to light. Longer shutter speeds let in more light, and so are often required in low-light conditions, or when the intention is to blur certain elements in the scene. Faster shutter

speeds are ideal for freezing motion, such as when photographing sports.

Display

The rear panel on the back of a camera which shows captured images and videos, as well as the live feed from the sensor. These are usually TFT LCD types, although some cameras now make use of Organic Light Emitting Diode (OLED) alternatives. Resolution is usually specified in dots: compact camera displays often have 230k or 460k dots, while those displays that are on high-end enthusiast compacts, CSCs and DSLRs are usually 921k dots or even higher.

the kind of image quality that can be achieved.

CSCs

CSCs fit somewhere between compacts and DSLRs, with the benefit of a small-format body and interchangeable lenses. Due to their mirrorless designs, optical viewfinders are exchanged for electronic variants that continue to get better all the time in terms of their resolution and sharpness.

Due to the lack of an established form factor, unlike DSLRs, CSCs come in a wide variety of shapes and sizes. Most differences are aesthetic, but a fair few affect the handling quite significantly too. Some models have thin, wide bodies, while others are shaped like DSLRs to provide more to wrap your hand around.

DSLRs

DSLRs range from beginner models, such as the Canon EOS 1100D, up to professional level models, such as the same company's EOS-1D X. The body shape is similar throughout, with a large hand grip and dials on the top, although most professional DSLRs are more square than rectangular, with additional shutter release buttons and dials to make portrait-orientation shooting comfortable.

The addition of an optical viewfinder is one of the unique features that differentiates a

CSC

An interchangeable-lens camera with no optical viewing assembly but either an electronic one, or just the LCD screen to shoot with. CSCs come in a wide variety of forms with a wide range of sensor sizes, so image quality varies greatly between models.



PROS

Typically smaller than DSLRs, HD video, Interchangeable lenses, Great image quality for the size

CONS

Optical viewfinders usually not available, Lens ranges, Premium models can be expensive

DSLR

The choice of professionals, a DSLR features interchangeable lenses, plus an optical viewfinder that sees what the lens sees thanks to a 45° mirror and prism assembly inside the camera. The bulkiest camera type, but the full frame models deliver the highest image quality.



PROS

Interchangeable lenses, Manual exposure control, HD video, Excellent ergonomics

CONS

Large and heavy bodies, Expensive, Poor-quality kit lenses often supplied as standard

DSLR model from most CSCs and compact cameras.

The only models that buck this trend, and as a result can't quite be described as true DSLRs, are those in the Sony SLT range, whose models include the A58 and A77. The SLT construction uses a translucent mirror which means it does not need to move in order for light to pass through to the sensor, in contrast to DSLRs which flip their mirrors up at the point of exposure. As a result the burst rate is faster; with the likes of the A77 able to shoot at up to 12fps. The disadvantage, depending on

your preference, is the presence of an electronic, rather than optical, viewfinder.

There are essentially two kinds of sensor used in DSLRs: APS-C and full frame, although full frame sensors are starting to creep into some CSCs such as the Sony Alpha 7 and 7R.

Full frame is described as such because it's roughly the same size as a 35mm negative. APS-C sensors are smaller, and as a result they only use the central part of a lens, which in turn increases their effective focal length (reducing the angle of view). This is known as a 'crop factor'. Full frame lenses

do not apply a crop factor to lenses, and so they maintain the same angle of view and focal length as if they were used on a film SLR.

DSLRs and CSCs also attract the attention of videographers, given the proliferation of HD video functionality and the range of lenses available. Many DSLRs – particularly those aimed towards a more discerning audience – also now incorporate ports for external microphones and have a full complement of options for different frame rates and output options as well as control over audio recording.

Optical viewfinder

A viewfinder which relies on an optical, rather than electronic, construction. DSLRs are equipped with optical viewfinders, which present the view through the lens. Those on cheaper DSLRs are constructed with a hollow chamber with mirrored sides (penta-mirrors) while those on pricier models feature a ground glass prism (pentaprism) which is brighter.

Electronic viewfinder (EVF)

An electronic alternative to an optical viewfinder. These are typically integrated into bridge cameras and some Compact System Cameras, where an optical

viewfinder is either not possible or less desirable. More recent EVFs are constructed from OLED panels rather than LCDs, and some of these are surprisingly detailed and bright.

Sensor size

The physical size of the sensor inside a camera. Cameras with larger sensors often produce better-quality images than those with smaller ones, as each photosite is larger. A larger capacity allows its signal-to-noise ratio to be higher; as a result images stand a better chance of having a wider dynamic range and of being less affected by noise.

ISO

Also known as 'sensitivity', the ISO range of a camera determines its latitude for capturing images in different conditions. For a given camera, images captured at lower sensitivities generally contain less noise than those captured higher up, as the signal from the sensor – which contains unwanted noise – requires less amplification.

Burstrate

The speed at which a camera can fire consecutive frames, given in frames per second (fps). Many recent cameras have a standard fps rate which captures at the sensor's full resolution, with further faster

options which output images at a reduced pixel count. Often a camera's fastest burst mode will only be possible with focus and exposure taken from the first frame.

Neutral Density (ND) filter

ND filters are commonly used with DSLR cameras, although some enthusiast compacts now have these integrated into their lenses. Their purpose is to reduce exposure times, so that longer shutter speeds can be used, with the 'neutral' part of their name signifying that they are designed to have no effect on the colour balance of an image.

Camera Listings

If you want maximum control over your creative shooting options, you want an interchangeable-lens camera, whether a DSLR model or a Compact System Camera model. Here we list and rate all the models on the market

DSLRs

NAME & MODEL	RRP	TESTED	SCORE	SUMMARY	SENSOR	LENS	MAX ISO	VIDEO	SHOOTING	SCREEN	DIMENSIONS
Canon EOS 1200D	£450	06/14	4★	Entry level update to Canon's 1100D, the 1200D excels in the key areas of AF speed and accuracy while ISO performance is good	16MP	Canon	12,800	1080p	9 3 95	• 3in	500 129.6 99.7 78 480g
Pentax K-500	£450	10/13	4★	Stripped-down version of K-500 without weather sealing boasts 100% glass prism viewfinder; uses AA batteries	16.3MP	Pentax	51,600	1080p	11 6 100	• 3in	410 130 97 71 646g
Sony Alpha 58	£450	07/13	4★	Replacement for A57 boasts Bionz image processing engine, OLED viewfinder, plus 20MP sensor – up from 16MP	20.1MP	Sony	16,000	1080p	15 5 100	• 2.7in •	690 129 95.5 78 492g
Pentax K-S1	£550	03/15	4★	The fully-specified K-S1 boasts excellent image quality, while still being a lightweight, compact and portable option	12.1MP	Pentax	51,200	1080p	• 11 5.4 100	• 3in	tbc 92.5 120 69.5 498g
Canon EOS 750D	£599	08/15	4★	A new addition to the EOS line-up, the 750D is designed for EOS newcomers, with a non-threatening layout	24.2MP	Canon	25,600	1080p	19 5 95 •	• 3in • •	440 131.9 100.7 77.8 555g
Nikon D3300	£600	04/14	4.5★	Nikon's new entry-level DSLR is smaller than previous offerings while a sensor with no anti-aliasing filter means detail is high	24.2MP	Nikon	25,600	1080p	• 11 5 95	• 3in	700 124 98 75.5 460g
Pentax K-30	£600	03/14	4★	Stellar image quality make this a welcome alternative to Canon, Nikon and Sony offerings at the price	16.3MP	Pentax	25,600	1080p	11 6 100	• 3in	410 96.5 128.5 71.5 660g
Pentax K-50	£600	10/13	4.5★	Replacement for K-30 offers 16MP sensor, weather sealing and improved processing. Still able to shoot at up to 6fps	16.3MP	Pentax	51,200	1080p	11 4 100	• 3in	410 130 97 71 650g
Canon EOS 760D	£649	NYT		A new addition to the EOS line-up, the 760D leans towards the aspiring enthusiast photographer	24.2MP	Canon	25,600	1080p	19 5 100 •	• 3in • •	440 131.9 101 77.8 565g
Pentax K-S2	£649	Web	4.5★	Pentax's latest mid-range DSLR continues its tradition of offering affordable yet well-specified cameras	20.2MP	Pentax	51,200	1080p	• 11 5.4 100 •	• 3in •	410 122.5 91 72.5 678g
Nikon D3200	£650	07/12	4.5★	With a 24MP sensor and excellent Guide mode, this is the perfect entry-level DSLR. Wi-Fi & GPS optional	24.2MP	Nikon	12,800	1080p	• 11 4 95	• 3in	540 125 96 76 505g
Canon EOS 100D	£650	07/13	4.5★	Billed as the world's smallest and lightest DSLR; kit lens is the company's EF-S 18-55 f/3.5-5.6 IS STM zoom. GPS optional	18MP	Canon	12,800	1080p	• 9 4 95	• 3in	380 117 91 69 407g
Nikon D5200	£720	03/13	4.5★	Inspired by the D5100 and D7000, the D5200 has a vari-angle LCD, 24MP sensor and HD video. Wi-Fi & GPS optional	24.1MP	Nikon	25,600	1080p	• 39 5 95	• 3in •	n/a 129 98 78 555g
Nikon D5500	£720	04/15	4.5★	New DX-format DSLR in Nikon's 'advanced beginner' range, updating the impressive D5300 and adding a touchscreen	24.2MP	Nikon	25,600	1080p	• 39 5 95 •	• 3.2in •	820 124 97 70 470g
Canon EOS 60D	£750	09/12	4.5★	Still current in the company's DSLR range, this semi-pro design packs in an 18MP CMOS sensor and a vari-angle screen	18MP	Canon	25,600	1080p	• 9 5 96	3in •	1,100 145 106 79 755g
Canon EOS 700D	£750	Web	4.5★	Update to 650D comes bundled with a new 18-55mm STM kit lens, that promises improved movie AF. GPS & Eye-Fi optional	18MP	Canon	12,800	1080p	• 9 5 95	• 3in •	440 133 100 79 580g
Sony Alpha 65	£790	02/12	4.5★	Featuring the same sensor as the A77, the A65 can rattle off 10 frames per second and has a crisp electronic viewfinder	24.3MP	Sony	16,000	1080p	• 15 10 100 •	• 3in	440 132 98 81 543g
Nikon D5300	£830	01/14	4.5★	Update on the D5200 with large sensor, larger screen, HD video, and long lasting battery, should appeal to videographers	24.2MP	Nikon F	25,600	1080p	• 23 5 95 • •	• 3.2in •	700 125 98 76 530g
Pentax K-5 II	£870	03/13	4.5★	Latest update to K-5 promises improved AF performance in low light and subject tracking with moving subjects	16.3MP	Pentax	51,200	1080p	• 11 7 100	• 3in	980 131 97 73 760g
Nikon D7200	£939	06/13	4★	Nikon's latest mid-range DSLR offers impressive new features over the D7100 it replaces at the top of Nikon's DX format range	24.2MP	Nikon F	25,600	1080p	• 51 6 100 •	• 3.2in	1,100 135.5 106.5 76 765g
Pentax K-3	£950	01/14	4★	Upgrade from Pentax K-5. GPS optional. Impersonates a low pass filter. High FPS rate and is the first to carry Ricoh's name	24.2MP	Pentax	51,200	1080i	• 27 8 100	• 3.2in	560 131 100 77 800g
Sony Alpha 77 MkII	£1000	09/14	4.5★	With the mkII Sony has brought built-in Wi-Fi, great handling and an enhanced AF that will suit sports and wildlife shooters	24.3MP	Sony	25,600	1080p	• 79 12 100 •	• 3in •	480 142.6 104 81 647g
Nikon D7000	£1100	01/11	4.5★	A semi-pro DSLR offering some fantastic features and which still has everything an aspiring photographer would need	16MP	Nikon	25,600	1080p	• 39 6 100	• 3in	1,050 132 105 77 690g
Canon EOS 70D	£1100	11/13	4.5★	World's first DSLR to boast Dual Pixel CMOS AF technology, giving the best autofocus performance for a DSLR during live view	20.2MP	Canon	12,800	1080p	• 19 7 98 •	• 3in •	920 139 104 79 755g
Nikon D7100	£1100	05/13	4.5★	The D7100 updates the D7000 in several significant ways, and while not without fault it's still praiseworthy. Wi-Fi optional	24.1MP	Nikon	25,600	1080p	• 51 6 100	• 3in	950 135 106 76 765g
Canon EOS 7D MkII	£1599	01/15	4.5★	A better sensor and improved AF over the 7D; this is one of the best APS-C DSLRs for enthusiasts and pros. Wi-Fi optional	20.2MP	Canon	51,200	1080p	• 65 10 100	• 3in	670 148.6 112.4 78.2 910g
Canon EOS 6D	£1700	02/13	4.5★	Superb image quality from Canon's latest – and cheapest – full-frame DSLR. Also offers Wi-Fi and GPS connectivity	20.2MP	Canon	102,400	1080p	• 11 4.5 97 • •	3in	980 145 111 71 755g
Nikon D610	£1800	12/13	5★	Upgrade from D600: improved auto white balance, faster continuous shooting and a quiet continuous mode. GPS optional	24.3MP	Nikon	25,600	1080p	• 39 6 100	• 3.2in •	900 141 113 82 850g
Sony Alpha 99	£1800	Xmas12	4★	Sony's full-frame A99 offers translucent mirror technology allied to a 19-point AF system with 11 cross sensors	24.3MP	Sony	25,600	1080p	• 19 10	• 3in •	500 147 111 78 812g
Nikon D750	£1800	12/14	5★	The D750 is one of the very best all-round enthusiast DSLRs currently available, with an impressive performance	24.3MP	Nikon	51,200	1080p	• 51 6.5 100 •	• 3.2in •	1,230 140.5 113 78 840g
Nikon D800	£2600	06/12	5★	Offering a massive 36MP, this is the camera to go for if you want to produce ultra-large prints. GPS optional	36.3MP	Nikon	25,600	1080p	• 51 4 100	• 3.2in	900 146 123 81 900g
Nikon DF	£2600	02/14	4★	Nikon's retro-tinged full-frame DSLR has a solid spec although it lacks a video mode. Overall, its images are superb	16.2MP	Nikon	204,800	-	39 5.5 100	3.2in	1,400 143.5 110 66.5 765g
Nikon D810	£2699	11/14	5★	Replacing the D800 and D800E, the D810 is a truly welcome upgrade and one of the very best DSLRs on the market	36.3MP	Nikon	51,200	1080p	51 12 100	• 3.2in	1,200 146 123 82 980g
Nikon D800E	£2600	08/12	4.5★	Removes the anti-aliasing filter of the D800 for even greater detail should you need it. GPS optional	36.3MP	Nikon	25,600	1080p	• 51 4 100	• 3.2in	900 146 123 81 900g
Canon EOS 5D Mk III	£2999	06/12	5★	An excellent full frame sensor, fast burst rate, high ISO range and advanced AF make this an impressive piece of kit. Wi-Fi optional	22.3MP	Canon	102,400	1080p	• 61 6 100	3.2in	950 152 116 76 950g
Canon EOS 5DS	£2999	NYT		New full-frame DSLR that builds on the great success of its EOS 5D Mark III, which sports a world-first 50.6MP full frame sensor	50.6 MP	Canon	12,800	1080p	• 61 5 100	3.2in	700 152 116.4 76.4 845g
Canon EOS 5DS R	£3199	09/15	5★	New 50MP full-frame DSLR, identical to the 5DS it was launched with except that it forgoes an optical low-pass filter	50.6 MP	Canon	12,800	1080p	• 61 5 100	3.2in	700 152 116.4 76.4 845g
Nikon D4	£5290	05/12	5★	Now updated by the D4S, the D4 is Nikon's previous flagship and one of the best DSLRs we've seen. GPS & Wi-Fi optional	16.2MP	Nikon	204,800	1080p	• 51 10 100	3.2in	2,600 160 156 90 1,340g
Nikon D4S	£5290	Web	5★	Nikon's flagship DSLR, the D4S takes the best features of the D4 and improved the burst speed, AF and processing power	16.2MP	Nikon	409,600	1080p	• 51 11 100	3.2in	3,020 160 156.5 90.5 1,330g
Canon EOS-1D X	£5300	11/12	5★	A contender for the crown of best DSLR on the market, this camera is hard to fault. GPS & Wi-Fi optional	18.1MP	Canon	204,800	1080p	• 61 12 100	3.2in	1,120 158 163 82 1,100g

COMPACT SYSTEM CAMERAS

Compact System Cameras									Stereo input	AF Points	Burst (FPS)	Viewfinder	Built-in Wi-Fi	Built-in GPS	Flash	Articulated	Touchscreen	Battery life (CIPA)	Width (mm)	Height (mm)	Depth (mm)	Weight
Name & Model	RRP	Tested	Score	Summary	Sensor	Lens	Max ISO	Video	Shooting					Screen				Dimensions				
Sony Alpha 3000	£350	12/13	2.5★	Compact, affordable, and delivers DSLR-style results	20.1MP	Sony E	16,000	1080p		25	3.5	•			•	3in		480	128	91	84.5	353g
Samsung NX3000	£350	10/14	4★	This may well be the best-value NX camera yet	20.3MP	Samsung	25,600	1080p		21	5		•			3in	•	370	117.4	66	39	266g
Panasonic Lumix GF6	£400	Web	4★	Newly developed Venus Engine and a 180° tilt screen	16MP	Mic4/3	25,600	1080p	•	23	20		•		•	3in	•	340	111	65	38	323g
Pentax Q7	£400	11/13	3★	Extra large sensor and improved AF	12.4MP	Pentax	12,800	1080p		25	5				•	3in		250	102	58	34	200g
Olympus PEN E-PM2	£400	Web	3★	Update to E-PM1 offers 16.1MP sensor	16.1MP	Mic4/3	25,600	1080p	•	35	8				•	3in	•	360	110	64	34	269g
Samsung NX Mini	£400	Web	4★	The light and compact NX Mini is very impressive	21MP	Samsung	25,600	1080p		35	6		•		•	3in	•	530	119	62	22.5	196g
Sony Alpha 5000	£420	Web	4★	Aims to compete with entry-level DSLRs	20.1MP	Sony	16,000	1080p		-	-				•	3in		-	110	63	36	296g
Nikon 1 S1	£480	Web	4★	User-friendly with an uncluttered interface	10.1MP	Nikon 1	6400	1080p		135	60		•		•	3in		220	102	61	30	197g
Olympus PEN E-PL5	£480	02/13	4★	One of the most competent CSCs at the price	16MP	Mic4/3	12,800	1080p	•	23	20		•		•	3in	•	360	110	64	34	261g
Olympus PEN E-PL7	£499	01/15	4★	High spec, compact size and superb image quality	16MP	Mic4/3	25,600	1080p		81	8		•		•	3in		350	114.9	67	38.4	357g
Nikon 1 J4	£499	11/14	4★	Excellent shooting speed and AF performance	18.4MP	Nikkor 1	12,800	1080p		171	20		•			3in	•	300	99.5	60	28.5	192g
Fujifilm X-A1	£500	12/13	4★	Virtually identical to X-M1, but with a standard sensor	16.3MP	Fuji X	25,600	1080p		41	5.6		•		•	3in	•	350	117	66.5	39	330g
Samsung NX300	£530	06/13	4.5★	Company adds to its range of Wi-Fi-enabled cameras	20.3MP	Samsung	25,600	1080p		105	8.6		•	•		3.3in	•	320	122	64	41	284g
Nikon 1 J3	£540	Web	3★	Boasts a 14.2MP sensor from range-topping V2	14.2MP	Nikon 1	6400	1080p		135	60				•	3in		220	101	61	29	244g
Sony NEX-5T	£540	01/14	4★	APS-C sensor delivers DSLR results	16.1MP	Sony E	25,600	1080p		25	3		•		•	3in	•	330	111	59	39	276g
Sony Alpha 5100	£549	12/14	4★	One of the very best in class, in video and image quality	24MP	Sony E	25,600	1080p		179	6		•		•	3in	•	400	110	63	36	283g
Panasonic Lumix G6	£550	07/13	4.5★	DSLR-like performance and images	16MP	Mic4/3	25,600	1080p	•	23	7	•	•		•	3in	•	n/a	122	85	72	340g
Canon EOS M3	£599	07/15	4★	The M3 looks set to appeal to enthusiast photographers	24.3MP	Canon M	25,600	1080p	•	49	4.2		•		•	3in	•	250	110.9	68	44.4	366g
Panasonic Lumix GM1	£629	01/14	4.5★	Tiny, retro compact design is impressive	16MP	Mic4/3	25,600	1080p		23	5		•		•	3in	•	230	99	55	30	204g
Sony Alpha 6000	£670	06/14	4.5★	Class-leading AF and an impressive APS-C sensor	24MP	Sony	25,600	1080p		179	11	•	•		•	3in	•	310	120	67	45	344g
Panasonic Lumix G7	£679	08/15	4★	The G7 is Panasonic's fifth model to have video capture	16MP	Mic4/3	25,600	3840p		8	•	•	•		•	3in	•	360	124.9	86.2	77.4	
Fujifilm X-M1	£680	10/13	4★	Company's third CSC features X-mount lens mount	16.3MP	Fuji X	6400	1080p		54	5.6		•		•	3in	•	350	117	67	39	330g
Olympus OM-D E-M10	£699	05/14	4.5★	Maintains the high-end features of its OM-D siblings	16MP	Mic4/3	25,600	1080p	•	81	8	•	•		•	3in	•	320	119	82	46	396g
Canon EOS M	£700	XM4S12	4.5★	Shares much of its functionality with the EOS 650D DSLR	18MP	Canon M	25,600	1080p		31	4.3		•		•	3in	•	230	109	66.5	32	298g
Panasonic Lumix GM5	£749	01/15	4★	Small CSC with an electronic viewfinder	16MP	Mic4/3	25,600	1080p	•	23	5.8	•	•		•	3in	•	210	98.5	59.5	36	211g
Nikon 1 AW1	£749	12/13	3.5★	High-end CSC is waterproof and shockproof	14.2MP	Nikon 1	6400	1080p		41	15		•	•	•	3in		220	113	71.5	37.5	356g
Nikon 1 V2	£800	02/13	3.5★	Revamp for V1. Price includes 10-30mm kit lens	14.2MP	Nikon 1	6400	1080p	•	73	15				•	3in		n/a	109	82	46	277g
Sony NEX-6	£800	01/13	4★	Excellent EVF and fast operation	16.1MP	Sony E	25,600	1080p	•	25	10	•	•		•	3in	•	360	120	67	43	287g
Olympus OM-D E-M5 mkII	£900	05/15	5★	Olympus's latest premium CSC boasts several improvements	16MP	Mic4/3	25,600	1080p	•	81	10	•	•			3in	•	750	123.7	85	44.5	469g
Panasonic Lumix GX7	£900	10/13	4.5★	With fast AF and tiltable EVF, delivers excellent results	16MP	Lumix G	25,600	1080p		23	40	•	•		•	3in	•	n/a	122.6	70.7	43.3	402g
Olympus PEN E-P5	£900	09/13	4.5★	No built-in EVF but has fast AF plus high quality images	16MP	Mic4/3	25,600	1080p		35	9		•	•	•	3in	•	330	122	69	37	420g
Samsung NX30	£900	Web only	4.5★	A DSLR-style CSC with a burst rate of up to 8fps	21MP	Samsung	26,500	1080p		247	8	•	•	•	•	3in		360	127	96	58	375g
Fujifilm X-T1	£1100	4/12	5★	One of the best premium CSCs on the market	16.3MP	Fuji X	51,200	1080p	•	49	8	•	•		•	3in	•	350	129	89.8	46.7	440g
Panasonic Lumix GH3	£1120	XM4S12	5★	Responsive touchscreen and superb video mode	16MP	Mic4/3	25,600	1080p		23	6	•	•		•	3in	•	540	133	93.4	82	470g
Fujifilm X-E1	£1149	01/13	4.5★	Solid build, retro design and high image quality	16MP	Fuji X	25,600	1080p		49	6		•		•	3in		350	129	75	38	350g
Olympus OM-D E-M5	£1150	5/12	4.5★	The re-imagining of the classic Olympus OM	16MP	Mic4/3	25,600	1080p	•	35	9	•	•		•	3in	•	tbc	121	89.6	41.9	373g
Fujifilm X-E2	£1200	02/14	4.5★	Has over 60 improvements on the X-E1	16.3MP	Fuji X	25,600	1080p		49	7	•	•		•	3in		350	129	75	37	350g
Samsung NX1	£1299	02/15	5★	The first camera with an APS-C BSI sensor is impressive	28.2MP	Samsung	25,600	4096p	•	205	15	•	•		•	3in	•	tbc	138.5	102.3	65.8	550g
Panasonic Lumix GH4	£1300	07/14	4★	Both 4K video quality and still images are impressive	16MP	Mic4/3	25,600	4096p	•	49	12	•	•		•	3in	•	500	133	93	84	560g
Samsung Galaxy NX	£1300	10/13	4★	World's first 3G/4G Android CSC	20.3MP	Samsung	25,600	1080p	•	105	8.6	•	•	•	•	4.8in	•	-	137	101	26	495g
Olympus OM-D E-M1	£1300	12/13	5★	Fully weather-proofed and Wi-Fi enabled	16.8MP	Mic4/3	25600	1080p	•	81	10	•	•		•	3in	•	330	130	93.5	63	497g
Sony Alpha 7	£1300	01/14	4.5★	One of the lightest, smallest full-frame cameras	24.3MP	Sony E	25,600	1080p	•	117	5	•	•		•	3in	•	340	127	94	48	474g
Leica T	£1350	08/14	4★	Excellent image quality	16MP	Leica T	12,500	1080p		195	5		•		•	3.7in	•		134	69	33	384g
Fujifilm X-Pro1	£1430	05/12	5★	Offers innovations including a hybrid viewfinder	16MP	Fuji X	25,600	1080p		49	6		•			3in		300	139	81.8	42.5	450g
Sony Alpha 7 II	£1498	03/15	5★	The full-frame A7 II is at the top of Sony's CSC range	24.3MP	Sony E	25,600	1080p	•	117	5	•	•		•	3in		350	126.9	95.7	59.7	556g
Sony Alpha 7R	£1700	02/14	4.5★	One of the lightest, smallest full-frame cameras	36.4MP	Sony E	25,600	1080p	•	25	4	•	•			3in	•	340	127	94	48	465g
Sony Alpha 7S	£2099	09/14	4.5★	The Sony Alpha 7S is the latest Sony full-frame CSC	12.4MP	Sony E	409,600	1080p	•	25	5	•	•			3in	•	380	127	94.4	48.2	489g

Lens Listings

A DSLR or Compact System Camera is hugely affected by the lens attached to the front, as the light hitting the sensor impacts focus, exposure and image quality. Cast your eyes over our lens listings to find out which is best for you before you make a purchase

BUILT-IN FOCUS MOTOR

Some lenses incorporate a motor within the lens to drive the autofocus, while others are powered by motors within the camera. The former will focus quicker than the latter. Canon lens motors are USM (Ultrasonic Motor), Sigma HSM (Hypersonic-Motor).

35mm Compatibility

Most digital sensors are smaller than 35mm, which is why lenses designed for digital can be smaller.

LENS MOUNTS

Each manufacturer has its own lens mount and most aren't compatible with one another. For example, a Canon DSLR can't use Nikon lenses, though you can use independent brands if you get them with the right mount.

FILTER THREAD

In order to correct for colour casts or create more contrast, a screw-in filter can be used. The thread at the front of the camera will have a diameter, in mm, which will allow you to attach a variety of filters or adapters to the lens.

MAGNIFICATION FACTOR

If you're changing from a 35mm SLR, your lenses won't provide the same field of view on a DSLR unless you have a "full-frame" model. So for Nikon, Pentax and Sony DSLRs, magnify the focal length by 1.5x to get a 35mm equivalent; for Canon 1.6x and Sigma 1.7x.



Maximum Aperture

Wider apertures mean you can use faster, motion-stopping shutter speeds.

Lens types explained



Fixed focal length (PRIME)

Fixed lenses offer wider maximum apertures and superior image quality. A 50mm lens is perfect for low light, 85-105mm is ideal for portraits, while a 300mm+ tele is for sports shooters.



Telephoto zoom

Telephotos are great for sport and wildlife, while short teles are good for portraits. Telephoto lenses magnify camera shake, so look for one with Image Stabilisation to ensure you achieve the sharpest shots possible.



Standard zoom

Most DSLRs come with a standard zoom which spans from moderate wideangle to short telephoto. These 'kit' lenses are fine for most purposes, but there are alternatives that offer superior image quality.



Superzooms

While they rarely compare with shorter lenses in image quality, a superzoom offers convenience. Great for travelling when you're conscious of weight, don't expect pin-sharp, aberration-free images.



Wideangle zoom

Wideangle lenses make subjects seem further away, enabling you to get more into the shot – perfect for landscapes and architecture. The most popular wideangle zooms are the 10-20mm and 12-24mm ranges.



Macro lenses

A true macro lens lets you reproduce your subject at life-size (1:1) or half life-size (1:2) on the sensor. Macro lenses come in various focal lengths and extension tubes can offer a greater magnification.

LENS SUFFIX GUIDE USED BY MANUFACTURERS

AD Tamron Anomalous Dispersion elements	DG Sigma's designation for all lenses	FE Tokina floating element lenses	N Nikon's Nano Crystal Coating	SWD Olympus Supersonic Wave Drive
AF-DC Nikon defocus feature	DI Tamron lenses for full-frame sensors	G Nikon lenses without an aperture ring	OS Sigma's Optically Stabilised lenses	SWM Nikon lenses with a Silent Wave Motor
AF-S Nikon lenses with Silent Wave Motor	DI-II Tamron lenses designed for APS-C	HF Sigma Helical Focusing	PRO Tokina's Professional range of lenses	TS-E Canon Tilt and Shift lens
APO Sigma Apochromatic lenses	DO Canon diffractive optical element lenses	HID Tamron's High Index Dispersion glass	RF Sigma & Nikon Rear Focusing	UD Canon Ultra Low Dispersion glass
ASP Tamron lenses featuring aspherical elements	DT Sony lenses for APS-C sized sensors	HLD Tokina low dispersion glass	SD Tokina's Super Low Dispersion element	USM Canon lenses with an Ultrasonic Motor
ASL Sigma lenses featuring aspherical elements	DX Nikon's designation for digital lenses	HSM Sigma's Hypersonic Motor	SDM Pentax's Sonic Direct Drive Motor	VC Tamron's Vibration Compensation
AT-X Tokina's Advanced Technology Extra Pro	ED Low Dispersion elements	IF Internal Focusing	SF Canon lenses with Softfocus feature	VR Nikon's Vibration Reduction feature
CRC Nikon's Close Range Correction system	EF Canon's full-frame lenses	IRF Tokina's Internal Rear Focusing lenses	SHM Tamron's Super Hybrid Mount	XR Tamron Extra Refractive Index glass
D Nikon lenses that communicate distance info	EF-S Canon lenses for APS-C sized sensors	IS Canon's Image Stabilised lenses	SIC Nikon's Super Integrated Coating	ZL Tamron's Zoom Lock feature
DA Pentax lenses optimised for APS-C sized sensors	EX Sigma's 'Excellent' range	L Canon's 'Luxury' range of lenses	SLD Sigma Super Low Dispersion elements	
DC Sigma's designation for digital lenses	FC Tokina's Focus Clutch Mechanism	LD Tamron Low Dispersion glass	SP Tamron's Super Performance range	
DF Sigma lenses with dual focus facility	FE Canon's fisheye lenses	M-OIS Mega Optical Image Stabilisation	SSM Sony/Minolta Supersonic Motor lenses	

CANON					Image Stabilisation	Mount	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
LENS	RRP	TESTED	SCORE	SUMMARY							
EF 8-15mm f/4 L USM	£1499	NYT		Impressive-looking fisheye zoom lens from Canon		•	15	n/a	78.5	83	540g
EF-S 10-18mm f/4.5-5.6 IS STM	£299	11/14	4★	A superb ultra wideangle that's a must-have for anyone shooting landscapes and cityscapes	•	•	22	67	74.6	72	240g
EF-S 10-22mm f/3.5-4.5 USM	£990	9/09	4★	A good performer, with solid MTF curves and minimal chromatic aberration	•	•	24	77	83.5	89.8	385g
EF 11-24mm f/4L USM	£2799	NYT		Long-awaited by Canon full-frame users, this is the world's widest-angle rectilinear zoom lens	•	•	28	n/a	108	132	1180g
EF 14mm f/2.8 L II USM	£2810	7/10	4.5★	Impressive resolution at f/8 but less so wide open	•	•	20	n/a	80	94	645g
EF-S 15-85mm f/3.5-5.6 IS USM	£900	3/11	4★	4-stop image stabilisation and Super Spectra coatings, together with a useful range	•	•	35	72	81.6	87.5	575g
EF 16-35mm f/2.8 L II USM	£1790	6/10	4.5★	Mark II of above lens, and a good performer with strong results at f/8 in particular	•	•	28	82	88.5	111.6	635g
EF 16-35mm f/4L IS USM	£1199	9/14	4★	Versatile and with a useful IS system, this is a very good ultra-wideangle zoom for full frame cameras	•	•	28	77	82.6	112.8	615g
TS-E 17mm f/4 L	£2920	NYT		Tilt and shift optic with independent tilt and shift rotation and redesigned coatings	•	•	25	77	88.9	106.9	820g
EF 17-40mm f/4 L USM	£940	11/08	4★	Designed to match the needs of demanding professionals – and does so with ease	•	•	28	77	83.5	96.8	500g
EF-S 17-55mm f/2.8 IS USM	£795	2/13	4★	Very capable lens with three-stop image stabilisation, Super Spectra coating and a circular aperture	•	•	35	77	83.5	110.6	645g
EF-S 17-85mm f/4-5.6 IS USM	£600	11/08	3★	Doesn't really live up to its promises. The zoom range is excellent but there are better alternatives	•	•	35	67	78.5	92	475g
EF-S 18-55mm f/3.5-5.6 IS II	£220	11/08	3.5★	Given the low price of this zoom, its results are very impressive	•	•	25	58	68.5	70	200g
EF-S 18-135mm f/3.5-5.6 IS	£500	NYT		4-stop image stabilisation and automatic panning and tripod detection	•	•	45	67	75.4	101	455g
EF-S 18-200mm f/3.5-5.6 IS	£740	10/11	4★	Automatic panning detection (for image stabilisation) and a useful 11x zoom range	•	•	45	72	78.6	102	595g
EF 20mm f/2.8 USM	£610	NYT		Wideangle lens with a floating rear focusing system and a USM motor	•	•	25	72	77.5	70.6	405g
EF 24mm f/1.4 L II USM	£2010	NYT		Subwavelength structure coating, together with UD and aspherical elements	•	•	25	77	93.5	86.9	650g
EF 24mm f/2.8 IS USM	£750	05/13	4★	Small wideangle optic with image stabilisation	•	•	25	58	67.5	48.5	270g
TS-E 24mm f/3.5 L II	£2550	NYT		Tilt and shift optic with independent tilt and shift rotation and redesigned coatings	•	•	21	82	88.5	106.9	780g
EF 24-70mm f/2.8 L USM	£1540	7/09	4.5★	A solid performer with an excellent reputation that only years in the field can secure	•	•	38	77	83.2	123.5	950g
EF 24-70mm f/2.8 L II USM	£2300	XMAS 12	5★	Professional quality standard zoom lens with a fast aperture	•	•	38	82	88.5	113	805g
EF 24-70mm f/4 L IS USM	£1499	NYT		L-series zoom said to be compact, portable and aimed at both professionals and amateurs	•	•	38	77	83.4	93	600g
EF 24-105mm f/4 L IS USM	£1049	3/13	4.5★	An excellent all-round performer, and keenly priced too	•	•	45	77	83.5	107	670g
EF 24-105mm f/3.5-5.6 IS STM	£479	NYT		A versatile standard zoom lens that's an ideal route into full frame photography	•	•	40	77	83.4	104	525g
EF 28mm f/1.8 USM	£570	NYT		USM motor and an aspherical element, together with a wide maximum aperture	•	•	25	58	73.6	55.6	310g
EF 28mm f/2.8 IS USM	£730	05/13	3.5★	Lightweight and inexpensive lens, with a single aspherical element	•	•	30	52	67.4	42.5	185g
EF 28-135mm f/3.5-5.6 IS USM	£560	12/09	4.5★	Excellent optical performance, with the benefit of image stabilisation	•	•	50	72	78.4	96.8	540g
EF 28-300mm f/3.5-5.6 L IS USM	£3290	NYT		L-series optic with expansive range, image stabilisation and a circular aperture	•	•	70	77	92	184	1670g
EF 35mm f/2	£320	3/12	4.5★	A cut-price fixed focal length lens	•	•	25	52	67.4	42.5	210g
EF 35mm f/2 IS USM	£799	NYT		First 35mm prime from Canon to feature an optical stabilisation system	•	•	24	67	62.6	77.9	335g
EF 35mm f/1.4 L USM	£1720	NYT		L-series construction and a wide maximum aperture, with a ring-type USM	•	•	30	72	79	86	580g
EF 40mm f/2.8 STM	£230	NYT		A portable and versatile compact pancake lens. A fast maximum aperture enables low-light shooting	•	•	30	52	68.2	22.8	130g
EF 50mm f/1.2 L USM	£1910	NYT		Very wide maximum aperture and Super Spectra coatings, and a circular aperture	•	•	45	72	85.8	65.5	580g
EF 50mm f/1.4 USM	£450	2/10	5★	Brilliant performer, with a highly consistent set of MTF curves. AF motor is a tad noisy though	•	•	45	58	73.8	50.5	290g
EF 50mm f/1.8	£130	09/15	5★	Lightest EF lens in the range, with wide maximum aperture and a Micro Motor	•	•	45	52	68.2	41	130g
EF 50mm f/2.5 Macro	£350	NYT		Compact macro lens with floating system	•	•	23	52	67.6	63	280g
EF-S 55-250mm f/4-5.6 IS II	£330	1/12	4★	Ideal budget addition to the 18-55mm kit lens, with image stabilisation and USM	•	•	110	58	70	108	390g
EF-S 60mm f/2.8 Macro USM	£540	8/06	4★	Great build and optical quality, with fast, accurate and near-silent focusing	•	•	20	52	73	69.8	335g
MP-E65 f/2.8 1-5x Macro	£1250	NYT		Macro lens designed to achieve a magnification greater than 1x without accessories	•	•	24	58	81	98	710g
EF 70-200mm f/2.8 L USM	£1540	NYT		Non-stabilised L-series optic, with rear focusing and four UD elements	•	•	150	77	84.6	193.6	1310g
EF 70-200mm f/4 L IS USM	£1450	11/11	5★	A superb option for the serious sports and action photographer	•	•	120	67	76	172	760g
EF 70-200mm f/2.8 L IS II USM	£2800	10/10	5★	A great lens but also a costly one. Peak resolution at 0.4 cycles-per-pixel is simply amazing	•	•	120	77	88.8	199	1490g
EF 70-200mm f/4 L USM	£790	NYT		A cheaper L-series alternative to the f/2.8 versions available	•	•	120	67	76	172	705g
EF 70-300mm f/4.5-5.6 IS USM	£470	11/10	4★	A great level of sharpness and only the small apertures should be avoided	•	•	150	58	76	143	630g
EF 70-300mm f/4-5.6 L IS USM	£1600	7/11	5★	An L-series lens with a highly durable outer shell	•	•	120	67	89	143	1050g
EF 70-300mm f/4.5-5.6 DO IS USM	£1700	NYT		3-layer diffractive optical element and image stabilisation	•	•	140	58	82.4	99.9	720g
EF 75-300mm f/4-5.6 III	£300	NYT		Essentially the same lens as the 75-300mm f/4.0-5.6 III USM but with no USM	•	•	150	58	71	122	480g
EF 75-300mm f/4-5.6 III USM	£350	9/07	2.5★	Good but not outstanding. The inclusion of a metal lens mount is positive, though	•	•	150	58	71	122	480g
EF 85mm f/1.2 L II USM	£2640	8/06	4★	A well-crafted lens, with fast and quiet AF with good vignetting and distortion control	•	•	95	72	91.5	84.0	1025g
EF 85mm f/1.8 USM	£470	2/11	5★	Non-rotating front ring thanks to rear focusing system, as well as USM	•	•	85	58	75	71.5	425g
TS-E 90mm f/2.8	£1670	NYT		Said to be the world's first 35mm-format telephoto lens with tilt and shift movements	•	•	50	58	73.6	88	565g
EF 100mm f/2 USM	£559	NYT		A medium telephoto lens with a wide aperture, making it ideal for portraits	•	•	90	58	75	73.5	460g
EF 100mm f/2.8 Macro USM	£650	11/09	4★	A solid performer, but weak at f/2.8 (which is potentially good for portraits)	•	•	31	58	79	119	600g
EF 100mm f/2.8 L Macro IS USM	£1060	1/13	5★	Stunning MTF figures from this pro-grade macro optic	•	•	30	67	77.7	123	625g
EF 100-400mm f/4.5-5.6 L IS USM	£1940	NYT		L-series construction and optics, including fluorite and Super UD elements	•	•	180	77	92	189	1380g
EF 135mm f/2 L USM	£1360	NYT		L-series construction with two UD elements and wide maximum aperture	•	•	90	72	82.5	112	750g
EF 135mm f/2.8 SF	£520	NYT		Soft-focus feature with two degrees of softness	•	•	130	52	69.2	98.4	390g
EF 180mm f/3.5 L Macro USM	£1870	NYT		L-series macro lens with inner focusing system and USM technology	•	•	48	72	82.5	186.6	1090g
EF 200mm f/2 L IS USM	£7350	NYT		5-stop Image Stabilisation with tripod detection and Super Spectra lens coatings	•	•	190	52	128	208	2520g
EF 200mm f/2.8 L II USM	£960	NYT		Two UD elements and a rear-focusing system in this L-series optic	•	•	150	72	83.2	136.2	765g
EF 300mm f/2.8 L IS II USM	£7500	NYT		4-stop image stabilisation makes this lens perfect for action photography	•	•	200	52	128	248	2400g
EF 300mm f/4 L IS USM	£1740	NYT		Two-stop image stabilisation with separate mode for panning moving subjects	•	•	150	77	90	221	1190g
EF 400mm f/2.8 L IS USM	£9810	NYT		Super telephoto with ring-type USM, one fluorite element and image stabilisation	•	•	300	52	163	349	5370g
EF 400mm f/4 DO IS USM	£8000	NYT		Multi-layer diffractive optical element to correct for chromatic aberration	•	•	350	52	128	232.7	1940g
EF 400mm f/5.6 L USM	£1660	NYT		Super UD and UD elements, as well as a detachable tripod mount and built-in hood	•	•	350	77	90	256.5	1250g
EF 500mm f/4 L IS USM II	£5299	NYT		Full-time manual focus, a single fluorite element and dust and moisture protection	•	•	450	52	146	387	3870g

NIKON

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT					Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma				
10.5mm f/2.8 G ED DX Fisheye	£678	NYT		DX format fisheye lens with Nikon's Close-Range Correction system and ED glass					•		14	n/a	63	62.5	300g
10-24mm f/3.5-4.5 G ED AF-S	£834	10/09	4★	MTF performance is good from wide open to f/11, only breaking down past f/22					•		24	77	82.5	87	460g
12-24mm f/4 G ED AF-S DX	£1044	9/09	4★	This venerable optic may be a little weak at f/4, but otherwise it's a good performer					•		30	77	82.5	90	485g
14mm f/2.8 D ED AF	£1554	7/10	5★	A really nice lens that handles well and offers excellent image quality					•	•	20	n/a	87	86.5	670g
14-24mm f/2.8 G ED AF-S	£1670	2/08	5★	A remarkable piece of kit, producing sharp images with little chromatic aberration					•	•	28	n/a	98	131.5	970g
16mm f/2.8 D AF Fisheye	£762	NYT		Full-frame fisheye lens with Close-Range Correction system and 25cm focus distance					•	•	25	n/a	63	57	290g
16-35mm f/4 G ED AF-S VR	£1072	6/10	5★	A fantastic lens that deserves to be taken seriously, with very little CA throughout	•				•		28	77	82.5	125	685g
16-85mm f/3.5-5.6 G ED VR AF-S DX	£574	3/11	4★	Boasting Nikon's second-generation VR II technology and Super Integrated Coating	•				•		38	67	72	85	485g
17-35mm f/2.8 D ED-IF AF-S	£1878	NYT		High-quality wideangle zoom for full-frame Nikon users					•	•	28	77	82.5	106	745g
17-55mm f/2.8 G ED-IF AF-S DX	£1356	3/07	4★	A higher quality standard zoom for DX-format DSLRs					•		36	77	85.5	110.5	755g
18-35mm f/3.5-4.5 G ED AF-S	£669	Xmas13	5★	Wideangle zoom with instant manual-focus override for full-frame DSLRs					•	•	28	77	83	95	385g
18-55mm f/3.5-5.6 G II AF-S DX	£156	12/08	3.5★	Entry-level standard zoom lens					•		28	52	73	79.5	265g
18-55mm f/3.5-5.6 G VR AF-S DX	£188	5/08	4★	An improvement over the above version, with excellent resolution the benefit of VR					•		28	52	70.5	74	205g
18-55mm f/3.5-5.6 G VR II AF-S DX	£229	NYT		Popular 3x zoom lens that is remarkably compact and lightweight, offering great portability	•				•		28	52	66	59.5	195g
18-105mm f/3.5-5.6 G ED VR AF-S DX	£292	8/12	4.5★	Kit lens for Nikon D90 & D7000 with Silent Wave Motor and Vibration Reduction					•		na	67	76	89	420g
18-200mm f/3.5-5.6 G IF-ED AF-S	£762	10/11	4.5★	4-stop VR II system, two ED and three aspherical elements in this DX superzoom lens	•				•		50	72	77	96.5	560g
18-300mm f/3.5-5.6 G ED-IF VR	£850	12/12	4★	DX-format zoom lens with wideangle to super-telephoto reach					•		45	77	83	120	830g
18-300mm f/3.5-6.3 G ED VR	£849	NYT		New DX-format 16.7x zoom with super-telephoto reach – a compact 'walkabout' lens	•				•		48	67	78.5	99	550g
20mm f/2.8 D AF	£584	NYT		Compact wideangle lens with Nikon's Close-Range Correction system					•	•	25	62	69	42.5	270g
24mm f/2.8 D AF	£427	NYT		Compact wide lens with Close-Range Correction system					•	•	30	52	64.5	46	270g
24mm f/1.4 G ED AF-S	£1990	8/10	5★	Nothing short of stunning. Aside from its high price there is very little to dislike about this optic					•	•	25	77	83	88.5	620g
24mm PC-E f/3.5 D ED PC-E	£1774	NYT		Perspective Control lens with Nano Crystal Coating and electronic control over aperture					•	•	21	77	82.5	108	730g
24-70mm f/2.8 G ED AF-S	£1565	7/09	5★	An excellent set of MTF curves that show outstanding consistency, easily justifying the price of this lens					•	•	38	77	83	133	900g
24-85mm f/3.5-4.5 G ED VR	£520	XMAS 12	5★	FX-format standard zoom with Auto Tripod detection and VR					•		38	72	78	82	465g
24-120mm f/4 G ED AF-S VR	£1072	5/11	5★	Constant maximum aperture of f/4 and the addition of VR makes this a superb lens	•				•	•	45	77	84	103	710g
28mm f/1.8 G ED AF-S	£619	4/13	5★	If you crave a wide aperture and prefer a single focal length then this Nikon prime delivers						•	25	67	73	80	330g
28mm f/2.8 D AF	£282	NYT		Compact wideangle lens with a minimum focusing distance of 25cm					•	•	25	52	65	44.5	205g
28-300mm f/3.5-5.6 G ED AF-S VR	£889	1/13	4.5★	Technical testing shows this zoom to be, as Nikon claims, the 'ideal walkabout lens'	•				•	•	50	77	83	114	800g
35mm f/1.8 G AF-S DX	£208	3/12	5★	Designed for DX-format DSLRs, a great standard prime lens					•		30	52	70	52.5	200g
35mm f/1.8 G ED AF-S	£TBC	NYT		Fast FX-format prime lens with bright f/1.8 aperture. Versatile and lightweight					•		25	58	72	71.5	305g
35mm f/2 D AF	£324	9/08	3★	At wide-aperture settings this optic achieves respectable resolution, which decreases with aperture					•	•	25	52	64.5	43.5	205g
35mm f/1.4 G ED AF-S	£1735	9/12	5★	A Nano Crystal-coated lens designed for the FX range					•	•	30	67	83	89.5	600g
40mm f/2.8 G AF-S DX Micro	£250	12/11	5★	A budget-priced macro lens that delivers the goods on multiple fronts					•		20	52	68.5	64.5	235g
45mm PC-E f/2.8 D ED	£1774	NYT		Perspective Control lens with ED glass and Nano Crystal Coating					•	•	25	77	83.5	112	780g
50mm f/1.2	£855	NYT		Ultra-fast f/1.2 aperture prime lens					•		50	52	68.5	47.5	360g
50mm f/1.4 D AF	£292	2/10	5★	Entry-level prime puts in a fine performance while offering backwards compatibility with AI cameras					•	•	45	52	64.5	42.5	230g
50mm f/1.4 G AF-S	£376	2/10	5★	Internal focusing and superior AF drive makes this a good alternative to the D-series 50mm f/1.4	•				•	•	45	58	73.5	54	280g
50mm f/1.8 D AF	£135	NYT		Compact, lightweight, affordable prime, will stop down to f/22					•	•	45	52	63	39	160g
50mm f/1.8 G AF-S	£200	9/11	5★	A cut-price standard lens for FX shooters or a short telephoto on DX-format DSLRs					•	•	45	58	72	52.5	185g
55mm f/2.8 Micro	£625	NYT		Macro lens with 1/2 maximum reproduction ratio					•		25	52	63.5	62	290g
55-200mm f/4-5.6 G VR AF-S DX	£314	8/07	3.5★	Designed for DX-format cameras, with Vibration Reduction and SWM technology					•		110	52	73	99.5	335g
55-300mm f/4.5-5.6 G VR AF-S DX	£378	1/12	3★	Offers a wide telephoto coverage, but better options available					•		140	58	76.5	123	530g
58mm f/1.4 G AF-S	£1599	2/14	4★	FX-format full frame premium prime lens with large f/1.4 aperture					•	•	58	72	85	70	385g
60mm f/2.8 D AF Micro	£405	8/06	5★	Nikon's most compact Micro lens, with Close Range Correction (CRC) system					•	•	22	62	70	74.5	440g
60mm f/2.8 G ED AF-S Micro	£500	NYT		Micro lens with 1:1 repro ratio, as well as a Silent Wave Motor and Super ED glass					•	•	18	62	73	89	425g
70-200mm f/2.8 G ED VR II AF-S	£2085	10/10	5★	Very little to fault here, with stunning image quality and consistent results at different focal lengths	•				•	•	140	77	87	209	1540g
70-200mm f/4 G ED VR	£1180	7/13	5★	Latest 70-200mm offers third-generation VR and weight savings over its more expensive f/2.8 cousin	•				•	•	1000	67	78	178.5	850g
70-300mm f/4.5-5.6 G ED AF-S VR	£556	11/10	4★	Feature-packed optic, with a VR II system, 9-bladed diaphragm, SWM and ED glass	•				•	•	n/a	67	80	143.5	745g
80-400mm f/4.5-5.6 D ED VR AF	£1512	NYT		3-stop Vibration Reduction with panning detection and a nine-bladed diaphragm	•				•	•	230	77	91	171	1340g
85mm f/3.5 G ED AF-S DX VR	£522	NYT		DX-format Micro lens with a 1:1 reproduction ratio, VR II system and ED glass	•				•		28	52	73	98.5	355g
85mm f/1.4 G AF-S	£1532	2/11	5★	Fast mid-tele lens with an internal focusing system and rounded diaphragm					•	•	85	77	86.5	84	595g
85mm f/1.8 D	£385	NYT		Portable medium telephoto – ideal for portraits					•		85	62	71.5	58.5	380g
85mm f/1.8 G AF-S	£470	5/12	5★	Rear-focusing system and distance window in this medium telephoto lens					•	•	80	67	80	73	350g
105mm f/2.8 G AF-S VR II Micro	£782	11/09	4.5★	A very sharp lens, with swift and quiet focusing and consistent MFT results	•				•	•	31	62	83	116	720g
105mm f/2 D AF DC	£980	NYT		A portrait lens with defocus control					•	•	90	n/a	79	111	640g
135mm f/2 D AF DC	£1232	NYT		Defocus-Image Control and a rounded diaphragm in this telephoto optic					•	•	110	n/a	79	120	815g
180mm f/2.8 D ED-IF AF	£782	NYT		Useful telephoto length and internal focusing technology, together with ED glass					•	•	150	72	78.5	144	760g
200mm f/4 D ED-IF AF Micro	£1429	NYT		1:1 reproduction range in this Micro lens, with a Close-Range Correction system					•	•	50	62	76	104.5	1190g
200mm f/2 G ED AF-S VR II	£5412	NYT		A full-frame lens offering ghost-reducing Nano Crystal coating	•				•	•	190	52	124	203	2930g
300mm f/4 E PF ED VR AF-S	£1230	08/15	5★	Light, compact AF-S full-frame telephoto lens with ED glass elements	•				•	•	140	77	89	147.5	755g
300mm f/2.8 G ED AF-S VR II	£5209	NYT		This lens promises fast and quiet AF, and is fitted with Nikon's latest VR II system	•				•	•	230	52	124	267.5	2900g

OLYMPUS

OLYMPUS					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
LENS	RRP	TESTED	SCORE	SUMMARY			MOUNT								DIMENSIONS			
7-14mm f/4 ED	£1900	6/08	5★	An excellently constructed objective, with image quality to match			•						25	n/a	86.5	119.5	780g	
8mm f/3.5 ED Fisheye	£930	NYT		Diagonal fisheye lens, offering a 180° view and a splash-resistant construction			•						13	n/a	79	77	485g	
9-18mm f/4-5.6	£640	9/09	4★	Good results up to f/11, past which point resolution drops a little			•						25	72	79.5	73	280g	
12-50mm f/3.5-6.3 ED	£370	5/13	4★	Offers electromagnetic zoom mechanism plus variable zoom speed			•						20	72	57	83	211g	
12-60mm f/2.8-4 ED SWD	£1130	11/08	4.5★	While not quite as consistent as the 14-54mm, this optic is perhaps more versatile			•						25	72	79.5	98.5	575g	
11-22mm f/2.8-3.5	£1020	NYT		Wide angle (2x) addition to Olympus E-System lens range			•						28	72	75	92.5	485g	
14-35mm f/2 ED SWD	£2400	NYT		Pro lens with Supersonic Wave Drive AF system and dust and splashproof casing			•						35	77	86	123	915g	
14-42mm f/3.5-5.6 ED	£285	NYT		Small, light lens especially designed for the compact Four Thirds system standard			•						25	58	65	61	190g	
14-54mm II f/2.8-3.5 II	£660	12/09	4★	An affordable lens with great resolution – only CA control lets it down a touch			•						22	67	74.5	88.5	440g	
18-180mm f/3.5-6.3	£560	6/10	4★	A good performer everywhere except at 180mm, with a solid feel to it			•						45	62	78	84.5	435g	
25mm f/2.8 Pancake	£270	9/08	3.5★	Excellent image quality from such a tiny optic, but the lens cap is a little fiddly			•						20	43	64	23.5	95g	
35mm f/3.5 Macro	£270	NYT		Macro lens equivalent to 70mm on a full frame camera			•						14	52	71	53	163g	
35-100mm f/2	£2630	NYT		One Super ED and four ED elements inside this telephoto optic			•						140	77	96.5	213.5	1650g	
40-150mm f/4-5.6 ED	£300	NYT		ED and aspherical elements in this optic, together with an internal focusing system			•						90	58	65.5	72	220g	
50mm f/2 ED Macro	£600	8/06	3.5★	A fast, high-quality lens, with excellent MTF curves and low chromatic aberration			•						24	52	71	61.5	300g	
50-200mm f/2.8-3.5 ED SWD	£1300	NYT		Supersonic Wave Drive focusing system and an equivalent focal range of 100-400mm			•						120	67	86.5	157	995g	
70-300mm f/4-5.6 ED	£450	NYT		Three ED elements and multi-coatings feature in this popular tele-zoom optic			•						96	58	80	127	620g	
90-250mm f/2.8 ED	£6200	NYT		Dust and splashproof lens with 3 ED elements and a 180-500mm equivalent range			•						250	105	124	276	3270g	
150mm f/2 ED	£2650	NYT		Splashproof telephoto lens with a wide maximum aperture			•						140	82	100	150	1610g	
300mm f/2.8 ED	£7800	NYT		Splashproof telephoto lens with three ED elements and an inner focusing system			•					•	240	43	129	281	3290g	

PENTAX

PENTAX					Image Stabilisation											
					Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
LENS	RRP	TESTED	SCORE	SUMMARY	MOUNT						DIMENSIONS					
DA 10-17mm f/3.5-4.5 smc ED IF	£590	NYT		Fisheye zoom lens with Super Protection coating and Quick Shift manual focus					•			14	n/a	71.5	68	320g
DA 12-24mm f/4 smc ED AL IF	£1050	NYT		Two aspherical elements, ELD glass and a constant aperture of f/4 in this wide zoom					•			30	77	83.5	87.5	430g
DA 14mm f/2.8 smc ED IF	£730	7/10	4.5★	Best performance lies between f/5.6 and f/11, but good results can be had at f/4 too					•			17	77	83.5	69	420g
DA 15mm f/4 smc ED AL Limited	£820	NYT		Limited edition lens with hybrid aspherical and extra-low dispersion elements					•			18	49	39.5	63	212g
DA* 16-50mm f/2.8 smc ED AL IF SDM	£950	1/09	3.5★	A nice balance and robust feel, but poor sharpness at f/2.8 (which significantly improves from f/4 onwards)					•	•		30	77	98.5	84	600g
DA 17-70mm f/4 smc AL IF SDM	£630	NYT		Featuring Pentax's Supersonic Direct-drive (SDM) focusing system					•			28	67	75	93.5	485g
DA 18-55mm f/3.5-5.6 smc II ED AL IF	£220	1/09	3.5★	Something of a bargain. Only the maximum apertures and awkward manual focusing really let it down					•			25	52	68	67.5	220g
DA 18-55mm f/3.5-5.6 smc AL WR	£229	NYT		A weather resistant construction and an aspherical element, as well as SP coating					•			25	52	68.5	67.5	230g
DA 18-135mm f/3.5-5.6 DA ED DC WR	£600	6/11	3.5★	A weather resistant mid-range zoom lens					•			40	62	73	76	405g
DA 18-270mm f/3.5-6.3 smc EDSM	£699	NYT		15x superzoom for company's K-mount DSLRs featuring two extra-low dispersion (ED) elements					•			49	62	76	89	453g
DA 20-40mm f/2.8-4 ED Limited DC WR	£829	NYT		With state-of-the-art HD coating, a completely round-shaped diaphragm, and weather-resistant					•			28	55	68.5	71	283g
DA 21mm f/3.2 smc AL Limited	£600	NYT		This limited-edition optic offers a floating element for extra-close focusing					•			20	49	63	25	140g
FA 31mm f/1.8 smc AL Limited	£1149	NYT		Aluminium body; when used on a Pentax DSLR offers a perspective similar to that of the human eye					•			30	58	68.5	65	345g
DA 35mm f/2.8 smc Macro	£640	9/08	4.5★	Despite slight edge softness, this lens performs excellently and is a pleasure to use					•			14	49	46.5	63	215g
DA 35mm f/2.4 smc DS AL	£180	3/12	5★	A budget price prime lens for beginners					•			30	49	63	45	124g
DA 40mm f/2.8 smc Limited	£450	NYT		Pancake lens with SMC coating and Quick Shift focusing system					•			40	49	63	15	90g
DA 40mm XS f/2.8 XS	£325	NYT		The world's smallest fixed focal length lens					•			40	N/A	62.9	9	52g
FA 43mm f/1.9 smc Limited	£729	NYT		Focal length is ideal for portraits as well as everyday use, and features an smc multi-layer coating					•			45	49	27	64	155g
FA 50mm f/1.4 smc	£399	NYT		High quality fast prime. The 'FA' indicates that its image circle covers the 35mm full-frame format					•			45	49	63.5	38	220g
DA 50mm f/1.8 smc DA	£249	NYT		Affordable short telephoto lens ideal for portraits					•	•		45	52	28.5	63	122g
DFA 50mm f/2.8 smc Macro	£550	NYT		Macro lens capable of 1:1 reproduction and with a Quick Shift focus mechanism					•	•		19	49	60	67.5	265g
DA* 50-135mm f/2.8 smc ED IF SDM	£1200	11/12	4★	Constant f/2.8 aperture; well suited to portraiture and mid-range action subjects					•	•		100	67	76.5	136	765g
DA 50-200mm f/4-5.6 smc ED WR	£210	NYT		Weather-resistant construction, Quick Shift focus system and an SP coating					•			n/a	49	69	79.5	285g
DA* 55mm f/1.4 smc SDM	£800	2/10	4.5★	Even despite questions about the particular sample tested, this lens scores highly					•	•		45	58	70.5	66	375g
DA 55-300mm f/4-5.8 smc ED	£370	10/12	4★	The lens boasts a useful focal range, as well as a dirt-resistant SP coating					•			140	58	75	111.5	440g
DA 55-300mm f/4-5.8 ED WR	£399	NYT		Weatherproof HD telephoto lens featuring quick shift focusing system					•	•		140	58	71	111.5	466g
DA 60-250mm f/4 smc ED IF SDM	£1450	10/12	4.5★	With a constant f/4 aperture and an ultrasonic motor for speedy focusing					•			110	67	167.5	82	1040g
DA 70mm f/2.4 smc AL Limited	£600	NYT		Medium telephoto lens with an aluminium construction and a Super Protect coating					•			70	49	63	26	130g
D-FA* 70-200mm f/2.8 ED DC AW	£1850	NYT		New addition to Pentax's high-performance Star (*) series developed for best image rendition					•	•		120	77	91.5	203	1755g
FA 77mm f/1.8 smc Limited	£1050	NYT		With Pentax's Fixed Rear Element Extension focusing system for 'sharp, crisp images'					•	•		70	49	48	64	270g
D-FA 100mm f/2.8 Macro	£700	NYT		Designed for both digital and film cameras, this macro lens boasts a 1:1 repro ratio					•	•		30	49	67.5	80.5	345g
D-FA 100mm f/2.8 Macro WR	£680	11/12	5★	Street price makes this something of a bargain for a true macro offering full-frame coverage					•	•		30	49	65	80.5	340g
FA 150-450mm f/4.5-5.6 ED DC AW	£2000	NYT		Super-telephoto lens with weather-resistance, designed to produce extra-sharp, high-contrast images					•	•		200	86	241.5	95	2000g
DA* 200mm f/2.8 smc ED IF SDM	£1000	8/12	4.5★	SDM focusing system on the inside, and dirtproof and splashproof on the outside					•	•		120	77	83	134	825g
DA* 300mm f/4 smc ED IF SDM	£1300	NYT		This tele optic promises ultrasonic focus and high image quality thanks to ED glass					•	•		140	77	83	184	1070g
DA 560mm f/5.6 ED smc AW	£5999	NYT		Prime offering focal length of 859mm when mounted on Pentax K-mount DSLR. Treated with HD coating					•	•		560	112	130	522	3040g

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18mm f2	£399
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23mm f1.4	£669
27mm f2.8	£309
18-55mm F2.8-4.0	£319
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56mm f1.2	£739
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90mm f2	£699
55-200mm F3.5-4.8	£509
50-230mm F4.5-6.7	£309

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LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	MOUNT						Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma				
8mm f/3.5 UMC Fisheye CS II	£274	NYT		Wideangle fisheye lens designed for digital reflex cameras with APS-C sensors		•	•	•	•			30	N/A	75	417g
10mm f/ 2.8 ED AS NCS CS	£429	NYT		Features a nano crystal anti-reflection coating system and embedded lens hood		•	•	•	•			24	N/A	86	580g
14mm f/2.8 ED UMC	£279	NYT		Ultra wideangle manual focus lens; bulb-like front element means no filters can be used		•	•	•	•	•		28	N/A	94	552g
16mm f/2.0 ED AS UMC CS	£389	NYT		Ultra wideangle lens for digital reflex cameras and mirrorless compact cameras fitted with APS-C sensors		•	•	•	•			20	N/A	89.4	583g
24mm f/1.4 AS UMC	£499	NYT		Fast ultra wideangle manual focus lens comprising 13 lenses arranged in 12 groups		•	•	•	•	•		25	77	95	680g
24mm f/3.5 AS T-S ED AS UMC	£789	NYT		Wideangle tilt-shift prime featuring 16 glass elements and f/3.5 maximum aperture		•	•	•	•	•		20	82	110.5	680g
35mm f/1.4 AS UMC	£369	3/13	4.5★	While manual focus only, this prime impressed us in real-world use, making it something of a bargain		•	•	•	•	•		30	77	83	660g
35mm T1.5 AS UMC VDSLR	£419	NYT		VDSLR version of 35mm f/1.4 AS UMC with de-clicked aperture ring for silent operation when used for video		•	•	•	•	•		30	77	83	660g
85mm f/1.4 IFMC	£239	NYT		Short fast telephoto prime, manual focus, aimed at portrait photographers		•	•	•	•	•		100	72	78	513

SIGMA

SIGMA					Image Stabilisation	Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
LENS	RRP	TESTED	SCORE	SUMMARY		MOUNT								DIMENSIONS			
4.5mm f/2.8 EX DC	£739	NYT		Circular fisheye lens designed for digital, with SLD glass and a gelatin filter holder		•	•	•					13	n/a	76	77.8	470g
8mm f/3.5 EX DG	£799	NYT		The world's only 8mm lens equipped with autofocus also boasts SLD glass		•	•	•	•				13	n/a	73.5	68.6	400g
8-16mm f/4.5-5.6 DC HSM	£800	10/10	4★	Excellent performance at 8mm which sadly drops at the 16mm end		•	•		•	•			24	72	75	105.7	555g
10mm f/2.8 EX DC	£599	NYT		A Hyper Sonic Motor (HSM) and built-in hood in this diagonal fisheye lens		•	•	•	•				13	n/a	75.8	83	475g
10-20mm f/3.5 EX DC HSM	£650	3/10	5★	An absolute gem of a lens that deserves a place on every photographer's wish list		•	•		•	•	•		24	82	87.3	88.2	520g
10-20mm f/4-5.6 EX DG HSM	£550	8/09	5★	A fine all-rounder, thanks to MTF curves which stay above 0.25 cycles-per-pixel down to f/16		•	•	•	•	•	•		24	77	83.5	81	470g
12-24mm f/4.5-5.6 EX DC HSM	£868	8/09	4★	A tightly matched set of MTF curves, but APS-C users are advised to look at the 10-20mm instead		•	•		•	•	•	•	28	n/a	87	102.5	600g
15mm f/2.8 EX DG	£629	7/10	4★	This fisheye optic puts in a very solid performance – not to be dismissed as a gimmick!		•	•		•	•	•	•	15	n/a	73.5	65	370g
17-50mm f/2.8 EX DC OS HSM	£689	NYT		FLD and aspherical elements, a constant f/2.8 aperture and Optical Stabilisation		•	•	•	•	•	•		28	77	83.5	92	565g
17-70mm f/2.8-4 DC Macro OS HSM	£449	NYT		Redesign of this well-received lens launches the 'Contemporary' range and sees it in more compact form		•	•	•	•	•	•		22	72	79	82	470g
18-35mm f/1.8 DC HSM	£799	11/13	5★	Said to be the world's first constant f/1.8 zoom; DOF equivalent of constant f/2.7 on full frame			•		•	•	•	•	28	72	78	121	810g
18-200mm f/3.5-6.3 DC	£349	3/08	3★	Good CA control at 200mm but otherwise an average performer		•	•		•	•	•		45	62	70	78.1	405g
18-200mm f/3.5-6.3 DC OS	£449	3/08	4★	Excellent resolution and consistent performance, but control over CA could be a little better		•	•		•	•	•		45	45	79	100	610g
18-250mm f/3.5-6.3 DC OS HSM	£572	1/10	4.5★	A very capable set of MTF curves that only shows minor weakness at wide apertures		•	•	•	•	•	•		45	72	79	101	630g
18-250mm f/3.5-6.3 DC Macro OS HSM	£500	NYT		Ultra-compact 13.8x high zoom ratio lens designed exclusively for digital SLR cameras		•	•	•	•	•	•		35	62	73.5	88.6	470g
18-300mm f/3.5-6.3 DC Macro OS HSM	£499	NYT		Compact and portable high ratio zoom lens offering enhanced features to make it the ideal all-in-one lens		•	•		•	•	•		39	72	79	101.5	585g
24mm f/1.4 DG HSM A	£799	06/15	5★	The latest addition to Sigma's 'Art' line of high-quality fast primes			•		•	•	•	•	25	77	85	90.2	665g
24-70mm f/2.8 EX DG IF HSM	£899	8/09	5★	Not perfect, but an excellent alternative to Canon and Nikon's 24-70mm lenses, with great MTF curves		•	•		•	•	•	•	38	82	88.6	94.7	790g
24-105mm f/4 DG OS HSM A	£849	3/14	4.5★	Serious full frame alternative to own-brand lenses at a lower price but with no compromises in the build		•	•		•	•	•	•	45	82	89	109	885g
30mm f/1.4 EX DC HSM	£490	9/08	3★	A consistent performer, with slightly weaker but not unacceptable performance wide-open		•	•	•	•	•	•		40	62	76.6	59	430g
35mm f/1.4 DG HSM Art	£799	9/13	5★	Large aperture prime; first lens in company's 'Art' series		•	•		•	•	•	•	30	67	77	94	665g
50mm f/1.4 EX DC HSM	£459	2/10	5★	This lens may be priced above the norm, but it delivers results which are similarly elevated		•	•		•	•	•	•	45	77	84.5	68.2	505g
50mm f/1.4 DG HSM Art	£849	7/14	4★	This lens is a unique design that pays off in truly excellent image quality		•	•		•	•	•	•	40	77	85.4	100	815g
50-500mm f/4.5-6.3 DG OS HSM	£1499	4/11	4★	A 10x zoom range, SLD elements and compatibility with 1.4x and 2x teleconverters		•	•	•	•	•	•	•	50-180	95	104.4	219	1970g
70-200mm f/2.8 EX DG OS HSM	£1539	NYT		Two FLD glass elements, said to have the same dispersive properties as fluorite		•	•	•	•	•	•	•	140	77	86.4	197	1430g
70-300mm f/4-5.6 APO DG Macro	£235	NYT		A 9-bladed diaphragm and two SLD elements in this tele-zoom lens		•	•		•	•	•	•	95	58	76.6	122	550g
70-300mm f/4-5.6 DG Macro	£173	5/09	3★	Generally unremarkable MTF curves, and particularly poor at 300mm		•	•		•	•	•	•	95	58	76.6	122	545g
85mm f/1.4 EX DG HSM	£890	2/11	5★	The Sigma's resolution from f/4 to f/8 is excellent		•	•		•	•	•	•	85	77	86.4	87.6	725g
105mm f/2.8 EX DG OS HSM	£649	12/11	4.5★	An optically-stabilised macro lens		•	•		•	•	•	•	31.2	62	78	126.4	725g
120-300mm f/2.8 DG HSM	£3599	NYT		First lens in company's 'Sports' series; switch enables adjustment of both focus speed and focus limiter		•	•		•	•	•	•	150-250	105	124	291	TBA
150mm f/2.8 EX DG OS HSM	£999	NYT		A macro lens offering image stabilisation		•	•		•	•	•	•	38	72	79.6	150	950g
150-500mm f/5-6.3 DG OS HSM	£999	6/09	3★	Significant softness at wide maximum apertures for all focal lengths		•	•		•	•	•	•	220	86	94.7	252	1780g
150-600mm f/5-6.3 DG OS HSM S	£1599	1/15	4★	This portable, high-performance telephoto zoom from Sigma's Sports line is dust and splashproof		•	•		•	•	•	•	260	105	121	290.2	2860g
180mm f/2.8 EX DG OS HSM	£1499	4/13	5★	1:1 macro lens featuring three FLD glass elements and floating inner focusing system		•	•		•	•	•	•	47	86	95	204	1640g
300mm f/2.8 APO EX DG	£2899	NYT		Extra Low Dispersion (ELD) glass, multi-layer coatings and a Hyper Sonic Motor		•	•		•	•	•	•	250	46	119	214.5	2400g
300-800mm f/5.6 EX DG HSM	£6999	NYT		A constant aperture of f/5.6 throughout the expansive 300-800mm zoom range			•		•	•	•	•	600	46	156.5	544	5880g
500mm f/4.5 APO EX DG	£4799	NYT		Telephoto lens with multi-layer coatings to 'optimise the characteristics of DSLRs'		•	•		•	•	•	•	400	46	123	350	3150g
800mm f/5.6 APO EX DG	£5499	NYT		HSM and compatibility with Sigma's 1.4x EX APO and 2x EX APO teleconverters			•		•	•	•	•	700	46	156.5	521	4900g

SONY					Image Stabilisation	MOUNT							Min-Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
LENS	RRP	TESTED	SCORE	SUMMARY		Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only					
11-18mm f4.5-5.6 DT	£609	9/09	3★	A solid overall performance that simply fails to be outstanding in any way		•							25	77	83	80.5	360g
16mm f/2.8 Fisheye	£709	NYT		Fisheye lens with a close focusing distance of 20cm and a 180° angle of view		•						•	20	n/a	75	66.5	400g
16-35mm f/2.8 ZA SSM T*	£1729	9/09	4.5★	High-end Zeiss wideangle zoom lens ideal for full frame Alpha DSLRs		•						•	28	77	83	114	900g
16-50mm f/2.8 SSM	£569	4/12	4★	Bright short-range telephoto lens		•						•	100	72	81	88	577g
16-80mm f/3.5-4.5 ZA T*	£709	4/09	4.5★	Carl Zeiss standard zoom lens		•						•	35	62	72	83	445g
16-105mm f/3.5-5.6 DT	£559	3/09	3★	An ambitious lens that is good in parts. Quality drops off at 105mm		•							40	62	72	83	470g
18-135mm f/3.5-5.6 DT SAM	£429	NYT		A versatile zoom with Direct Manual Focus	•	•						•	45	62	76	86	398g
18-200mm f/3.5-6.3 DT	£509	4/08	3★	While the focal range is certainly useful, the lens is an overall average performer		•							45	62	73	85.5	405g
18-250mm f/3.5-6.3 DT	£559	1/10	3.5★	Good overall, but performance dips at longer focal lengths		•							45	62	75	86	440g
20mm f/2.8	£559	9/11	3.5★	Wideangle prime lens with rear focusing mechanism and focus range limiter		•						•	25	72	78	53.5	285g
24mm f/2 ZA SSM T*	£1119	NYT		An impressively bright wideangle Carl Zeiss lens		•						•	19	72	78	76	555g
24-70mm f/2.8 ZA SSM T*	£1679	7/09	5★	Carl Zeiss mid-range zoom lens with superb optics ideal for full frame Alpha DSLRs		•						•	34	77	83	111	955g
28-75mm f/2.8 SAM	£709	NYT		A constant f/2.8 aperture and a Smooth Autofocus Motor (SAM) in this standard zoom		•						•	38	67	77.5	94	565g
30mm f/2.8 DT SAM Macro	£179	3/12	4★	Macro lens designed for digital with 1:1 magnification and Smooth Autofocus Motor		•							12	49	70	45	150g
35mm f/1.4 G	£1369	NYT		With an equivalent focal length of 52.5mm, a wide aperture and aspherical glass		•						•	30	55	69	76	510g
35mm f/1.8 DT SAM	£179	NYT		Budget price indoor portrait lens		•							23	55	70	52	170g
50mm f/1.8 DT SAM	£159	3/10	4.5★	A very useful lens that performs well and carries a rock-bottom price tag		•							34	49	70	45	170g
50mm f/1.4	£369	2/10	5★	While this lens performs well overall, performance at f/1.4 could be better		•						•	45	55	65.5	43	220g
50mm f/1.4 ZA SSM	£1300	Web	4★	Carl Zeiss design said to be ideal for quality-critical portraiture and low-light shooting		•						•	45	72	81	71.5	518g
50mm f/2.8 Macro	£529	NYT		A macro lens with a floating lens element		•						•	20	55	71.5	60	295g
55-200mm f/4-5.6 DT SAM	£219	NYT		Designed for cropped-sensor DSLRs, with a Smooth Autofocus Motor		•							95	55	71.5	85	305g
55-300mm f/4.5-5.6 DT SAM	£309	NYT		Compact, lightweight telephoto zoom offering smooth, silent operation		•							140	62	77	116.5	460g
70-200mm f/2.8 G	£1889	NYT		Super Sonic Wave motor and a constant f/2.8 aperture in this pro-grade tele zoom		•						•	120	77	87	196.5	1340g
70-200mm f/2.8 G SSM II	£TBC	NYT		High-performance G Series telephoto zoom lens		•							120		87	196.5	1340g
70-200mm f/4 G OSS	£949	10/14	4★	Compact, lightweight telephoto zoom lens for full-frame E-mount bodies	•	•							100	72	80	175	840g
70-300mm f/4.5-5.6 G SSM	£869	12/10	3.5★	G-series lens with ED elements, Super Sonic wave Motor and a circular aperture		•						•	120	62	82.5	135.5	760g
70-400mm f/4-5.6 G SSM II	£1799	NYT		Redesign of original features a new LSI drive circuit and promises faster autofocus		•						•	150	77	95	196	1500g
75-300mm f/4.5-5.6	£219	8/12	3★	Compact and lightweight zoom with a circular aperture		•						•	150	55	71	122	460g
85mm f/1.4 ZA Planar T*	£1369	NYT		Fixed focal length lens aimed at indoor portraiture		•						•	85	72	81.5	72.5	560g
85mm f/2.8 SAM	£219	NYT		A light, low price portraiture lens		•						•	60	55	70	52	175g
100mm f/2.8 Macro	£659	NYT		Macro lens with circular aperture, double floating element and wide aperture		•						•	35	55	75	98.5	505g
135mm f/1.8 ZA Sonnar T*	£1429	NYT		A bright, Carl Zeiss portrait telephoto lens		•						•	72	77	84	115	1004g
135mm f/2.8 STF	£1119	NYT		Telephoto lens with defocus effects		•						•	87	80	80	99	730g

TAMRON					Image Stabilisation	MOUNT							Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
LENS	RRP	TESTED	SCORE	SUMMARY		Sony Alpha	Canon	Four Thirds	Nikon	Pentax	Sigma	Full Frame Only					
10-24mm f/3.5-4.5 SP AF Di II LD Asph. IF	£511	2/10	3.5★	Good consistency at 10mm and 18mm, but a steep decline at 24mm		•	•	•	•				24	77	83.2	86.5	406g
15-30mm f/2.8 SP Di VC USD	£950	07/15	4★	Excellent value, this is the only wideangle zoom with image stabilisation and an f/2.8 aperture		•	•	•	•				28	N/A	98.4	145	1100g
16-300mm f/3.5-6.3 Di II VC PZD Macro	£600	8/14	4★	Versatile megazoom, a very good all-in-one solution, as long as you won't need to enlarge to A2 size		•	•	•	•				39	67	99.5	75	540g
17-50mm f/2.8 SP AF XR Di II LD Asph. IF	£450	2/09	4.5★	Very good optical performance, which peaks at f/5.6-8		•	•	•	•				27	67	74	81.7	434g
17-50mm f/2.8 SP AF XR Di II VC LD Asph. IF	£541	4/10	4.5★	Very strong performance at longer focal lengths but weaker at the other end		•	•	•	•				29	72	79.6	94.5	570g
18-200mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£306	3/08	3★	Excellent CA control in the centre, but unremarkable wideangle performance		•	•	•	•				45	62	73	83.7	423g
18-200mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£550	NYT		A redefined all-in-one lens to replace a shorter kit lens		•	•	•	•				50	62	62	96.7	460g
18-270mm f/3.5-6.3 AF XR Di II LD Asph. IF Macro	£613	1/10	4.5★	Much better results at shorter focal lengths than longer ones, but still impressive		•	•	•	•				49	72	79.6	101	550g
18-270mm f/3.5-6.3 AF Di II VC LD PZD IF Macro	£663	10/11	3★	The next-generation incarnation offers a new form of ultrasonic engine		•	•	•	•				49	62	74.4	88	450g
24-70mm f/2.8 SP Di VC USD	£1099	10/12	5★	Fast zoom with image stabilisation for both full-frame and APS-C cameras		•	•	•	•				38	82	88.2	116.9	825g
28-75mm f/2.8 SP AF XR Di LD Asph. IF Macro	£460	NYT		Standard zoom with constant f/2.8 aperture and minimum focusing distance of 33cm					•	•	•	•	33	67	73	92	510g
28-300mm f/3.5-6.3 AF XR Di LD Asph. IF Macro	£664	NYT		A useful 10.7x zoom range and low-dispersion elements in this optic		•	•	•	•			•	49	62	73	83.7	420g
60mm f/2 SP AF Di II LD IF Macro	£550	12/10	5★	Macro lens designed for APS-C sensor cameras, with 1:1 reproduction ratio		•	•	•	•				23	55	73	80	400g
70-200mm f/2.8 SP AF Di LD IF Macro	£817	10/09	4★	No image stabilisation and no advanced AF system, but at this price it's a steal		•	•	•	•			•	95	77	89.5	194.3	1150g
70-200mm f/2.8 Di VC USD	£TBC	NYT		Compact yet full-size telephoto zoom with vibration compensation		•	•	•	•				130	77	85.8	188.3	1470g
70-300mm f/4-5.6 SP VC USD	£300	1/12	4★	Ultrasonic Silent Drive (USD) technology for focusing and Vibration Compensation		•	•	•	•			•	150	62	81.5	142.7	765g
70-300mm f/4-5.6 AF Di LD Macro	£170	11/10	3.5★	Low dispersion glass and compatible with both full-frame and cropped-sensor DSLRs		•	•	•	•			•	95	62	76.6	116.5	435g
90mm f/2.8 SP AF Di Macro	£470	11/09	4★	A very nice macro lens that is capable of producing some fine images		•	•	•	•			•	29	55	71.5	97	405g
90mm f/2.8 Di Macro 1:1 VC USD	£TBC	NYT		Redesign of the 90mm f/2.8 SP AF Di Macro; comes with vibration compensation		•	•	•	•			•	30	58	115	76.4	550g
150-600mm f/5-6.3 SP VC USD	£1150	6/14	4★	Longest focal length of any affordable enthusiast zoom on the market and produces excellent results		•	•	•	•				270	95	105.6	257.8	1951g
180mm f/3.5 SP AF Di LD IF Macro	£896	11/10	5★	Two Low Dispersion elements and internal focusing system in this 1:1 macro lens		•	•	•	•			•	47	72	84.8	165.7	920g
200-500mm f/5-6.3 SP AF Di LD IF	£1124	6/09	4.5★	A well-matched and consistent set of MTF curves, with good performance at f/8-11		•	•	•	•			•	250	86	93.5	227	1237g

TOKINA

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Sony Alpha Canon Four Thirds Nikon Pentax Sigma Full Frame Only					
AT-X 107 (10-17mm) f/3.5-4.5 AF DX Fisheye	£550	NYT		Fisheye zoom lens with Water Repellent coating and Super Low Dispersion glass		•	14	n/a	70	71.1	350g
AT-X 116 (11-16mm) f/2.8 PRO DX	£515	6/12	4.5★	Wide zoom with a One-Touch Focus clutch mechanism and a constant f/2.8 aperture		•	30	77	n/a	89.2	560g
AT-X 12-28mm f/4 PRO DX	£529	NYT		Replacement for 12-24mm F4 wideangle zoom; for Nikon DX DSLRs		•	25	77	84	90	600g
AT-X 16-28mm f/2.8 PRO FX	£757	6/11	5★	A pro-end wideangle zoom aimed at full frame cameras		•	26	n/a	90	133	950g
AT-X 17-35mm f/4 PRO FX	£830	11/12	5★	One of the most capable super-wide zooms available, though only available in Canon and Nikon mounts		•	28	82	89	94	600g
AT-X 16.5-135 (16.5-135mm) f/3.5-5.6	£610	9/11	3.5★	Three aspherical and two SD elements, together with a useful focal range		•	50	77	84	78	610g
AT-X M100 (100mm) f/2.8 AF PRO D Macro	£360	11/09	4★	Some weaknesses wide-open, but reasonable MTF curves make this a decent optic		•	30	55	73	95.1	540g

ZEISS

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Sony Alpha Canon Four Thirds Nikon Pentax Sigma Full Frame Only					
12mm f/2.8 Touit Distagon T*	£959	5/14	5★	Designed specifically for Sony NEX and Fujifilm X-series CSC cameras. Very impressive performance		•	18	67		68	270g
18mm f/3.5 ZF.2	£1150	8/10	5★	No AF, but the optical and build qualities of this lens are nothing short of stunning		•	30	82	84	87	470g
21mm f/2.8 Distagon T*	£1579	NYT		A wideangle lens that doesn't compromise on optical quality		•	30	82	87	84	510g
25mm f/2 Distagon T*	£1350	NYT		A landscape lens with a fast aperture		•	25	67	71	95	570g
25mm f/2.8 Distagon T*	£750	NYT		A macro lens offering unrivalled quality		•	17	58	83	55	480g
28mm f/2 Distagon T*	£850	NYT		For low light shooting the 28mm lens has plenty of potential		•	24	58	64	93	520g
32mm f/1.8 Touit Planar T*	£700	7/14	4.5★	Optimised for use with APS-C format sensors, a fast standard lens for Fujifilm X-series cameras		•	23	52	72	76	200g
35mm f/1.4 Distagon T*	£1600	NYT		Promises to produce some stunning bokeh effects		•	30	72	120	122	850g
35mm f/2 Distagon T*	£940	NYT		An extremely fast focusing lens		•	30	58	64	97	530g
50mm f/1.4 Planar T*	£650	NYT		A portrait lens in its element in low light		•	45	72	66	69	350g
50mm f/2 Makro-Planar	£665	NYT		A macro lens with impressive-looking levels of sharpness		•	24	67	72	88	530g
100mm f/2 Makro-Planar	£1399	NYT		A rapid-focus portrait lens		•	44	72	76	113	680g

CSC Lens Listings

The range of lenses for CSC models is constantly evolving, so you have a fairly good choice when it comes to lenses for your CSC

CANON CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Canon M Micro 4 Thirds Samsung NX Sony E Pentax Q Nikon 1 Fujifilm Mount Full frame only					
EF-M 18-55mm f/3.5-5.6 IS STM	£269	NYT		Compact and versatile zoom lens		•	25	52	61	61	210g
EF-M 11-22mm f/4-5.6 IS STM	£355	NYT		Ultra-wideangle lens with a compact, retractable lens design		•	15	55	61	58.2	220g
EF-M 22mm f/2 STM	£220	NYT		Small and bright wideangle pancake lens		•	15	43	61	23.7	105g
EF-M 55-200mm f/4.5-6.3 IS STM	£330	NYT		Telephoto zoom that takes you closer to the action		•	100	52	60.9	86.5	260g

FUJIFI CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Mount	Min Focus (m)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						Canon M Micro 4 Thirds Samsung NX Sony E Pentax Q Nikon 1 Fujifilm Mount Full frame only					
XF 10-24mm f/4 R OIS	£849	NYT		Ultra wideangle lens, minimal ghosting with Fujis HT-EBG multi-layer coating		•	24	72	78	87	410
XF 14mm f/2.8 R	£729	7/13	5★	Ultra wideangle prime, high resolution to all corners, performance justifies price tag		•	18	58	65	58.4	235g
XC 16-50 f/3.5-5.6 OIS	£359	NYT		Lightweight lens for mirrorless X-series offers 24-75mm equivalent zoom range		•	30	58	62.6	98.3	195g
XF 16-55mm f/2.8 R LM WR	£899	06/15	5★	A flagship XF standard zoom lens with a constant f/2.8 aperture and weather-resistance		•	60	77	83.3	106	655g
XF 18mm f/2 R	£430	6/13	4★	A compact, wideangle lens with a quick aperture		•	18	52	64.5	40.6	116g
XF 18-135mm f/3.5-5.6 R LM OIS WR	£699	Xmas14	4★	Weather-resistant zoom for Fujifilm X mount, designed to be the perfect partner for the Fujifilm X-T1		•	45	77	75.7	97.8	490g
XF 18-55mm f/2.8-4 R	£599	NYT		Short zoom lens with optical image stabilisation		•	18	58	65	70.4	310g
XF 23mm f/1.4 R	£649	NYT		Premium wide-angle prime lens with fast maximum aperture		•	28	62	72	63	300g
XF 27mm f/2.8	£270	NYT		A high-performance single-focal-length lens		•	60	39	23	61.2	78g
XF 35mm f/1.4 R	£439	6/13	4★	Shallow depth of field and bokeh effects are simple to achieve with this lens		•	28	52	65	54.9	187g
XF 50-140mm f/2.8 R LM OIS WR	£1249	NYT		A telephoto zoom with a constant maximum aperture and weather-resistance		•	100	72	82.9	175.9	995g
XC 50-230mm f/4.5-6.7 OIS	£315	NYT		The XC lens range is designed to suit Fuji's mid range CSCs, and this lens has optical image stabilization		•	110	58	69.5	111	ttc
XF 55-200mm f/3.5-4.8 R LM OIS	£599	11/13	4★	Telephoto with built-in optical image stabilisation plus aperture control ring		•	110	62	118	75	580g
XF 56mm f/1.2 R	£899	9/14	4★	This wide-aperture portrait lens for X series cameras has great sharpness and detail and is great value		•	70	62	73.2	69.7	405g
XF 56mm f/1.2 R APD	£1090	NYT		Medium-telephoto prime lens, with fast f/1.2 lens and built-in APD filter producing creamy bokeh		•	70	62	73.2	69.7	405g
XF 60mm f/2.4 XF R Macro	£599	NYT		A short telephoto lens perfect for macro work		•	26.7	39	64.1	70.9	215g

NIKON CSC

NIKON CSC					Image Stabilisation													
LENS	RRP	TESTED	SCORE	SUMMARY		Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full frame only	MinFocus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						MOUNT									DIMENSIONS			
6.7-13mm f/3.5-5.6 VR 1	£459	NYT		Compact, lightweight, ultra-wide angle zoom lens with Vibration Reduction for Nikon 1 system	•							•		25	52	56.5	46	125g
10mm f/2.8	£229	2/12	4★	A wideangle lens for Nikon's 1 series of Compact System Cameras								•		20	40.5	55.5	22	77g
10-30mm f/3.5-5.6 VR	£149	NYT		Nikon's kit lens for the 1 series of CSC models	•							•		20	40.5	57.5	42	115g
10-100mm f/4.5-5.6 VR PD-ZOOM	£679	NYT		A powered zoom lens aided by the VR image stabilisation system on 1 system ompact	•							•		300	72	77	95	530g
10-100mm f/4-5.6 VR 1	£499	NYT		CX-format zoom lens with focal length range of 10-100mm (27-270mm 35mm equivalent)	•							•		35	55	60.5	70.5	298g
11-27.5mm f/3.5-5.6	£179	NYT		Compact standard zoom for Nikon 1 system								•		30	40.5	57.5	31	80g
18.5mm f/1.8	£179	NYT		Nikon's 1 series gains a traditional fast prime								•		20	40.5	56	36	70g
30-110mm f/3.8-5.6 VR	£229	NYT		A longer zoom lens, with image stabilisation, for the Nikon 1 series	•							•		100	40.5	60	61	180g
32mm f/1.2	£799	NYT		First 1 system lens to offer a silent wave motor and nano crystal coating								•		45	52	66	47	235g
70-300mm f/4.5-5.6 VR	£TBC	NYT		CX-format super-telephoto lens with a surprisingly compact body	•							•		7	62	73	108	550g

OLYMPUS CSC

OLYMPUS CSC					Image Stabilisation								Min focus (cm)		Filter Thread (mm)	Width (mm)	Length (mm)	Weight
LENS	RRP	TESTED	SCORE	SUMMARY		MOUNT									DIMENSIONS			
9-18mm (Micro) f/4-5.6 ED	£630	NYT		This super wideangle lens offers an equivalent focal range of 18-36mm in 35mm terms		•								25	52	56.5	49.5	155g
12mm (Micro) f/2.0 ED	£739	1/12	5★	A wideangle fixed lens for the Micro Four Thirds system		•								20	46	56	43	130g
12-40mm f/2.8	£899	NYT		Weather-resistant wideangle zoom with a constant aperture of f/2.8		•								20	62	69.9	84	382g
12-50mm (Micro) f/3.5-6.3 ED EZ	£349	NYT		A reasonably-priced MFT zoom lens										20	52	57	83	211g
17mm M.Zuiko f/1.8 MSC	£450	7/13	5★	Wide-aperture, wide-angle prime boasting excellent peak sharpness and no colour fringing										25	46	57	35	120g
17mm (Micro) f/2.8 Pancake	£300	5/10	4★	Results are impressive across the most-used apertures given the wide angle of view offered		•								20	37	57	22	71g
14-42mm (Micro) f/3.5-5.6 ED	£300	5/10	4★	Generally a good performer, but control over chromatic aberrations could be a little better		•								25	40.5	62	43.5	150g
14-42mm II R (Micro) f/3.5-5.6 II	£269	NYT		A redesigned variation of the standard kit lens										25	37	56.5	50	112g
14-150mm (Micro) f/4-5.6 ED	£630	NYT		Plenty of focal range is offered by this MFT lens		•								50	58	63.5	83	280g
14-150mm f/4-5.6 II	£550	NYT		High-powered zoom for all your needs – from wideangle to telephoto – plus weather-resistance										50	58	63.5	83	285g
25mm f/1.8	£370	NYT		Compact prime lens with ultra-bright f/1.8 aperture	•	•								25	46	57.8	42	137g
40-150mm f/2.8 ED	£1299	03/15	4★	This powerful 80-300mm 35mm equivalent focal length lens offers amazing portability for this pro class		•								70	72	79.4	160	760g
40-150mm R (Micro) f/4-5.6	£309	NYT		This middle-distance zoom lens has an 80-300mm 35mm equivalent focal length										90	58	63.5	83	190g
45mm (Micro) f/1.8	£279	2/12	5★	Fast-aperture lens for taking portrait shots proved to be sharp, quiet and without colour fringing										50	37	56	46	116g
60mm f/2.8 Macro	£450	NYT		High-precision macro lens that's dustproof and splashproof										19	46	56	82	185g
75-300mm II (Micro) f/4.8-6.7	£499	NYT		Update featuring Zuiko Extra-low Reflection Optical coating said to reduce ghosting		•								90	58	69	117	423g
75mm f/1.8 ED	£799	8/13	5★	Ultra-fast prime lens ideal for portraits and action shots		•								84	58	64	69	305g

PANASONIC CSC

PANASONIC CSC					Image Stabilisation	Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fuji X Mount	Full frame only	Min focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight	
LENS	RRP	TESTED	SCORE	SUMMARY		MOUNT									DIMENSIONS				
G 7-14mm f/4	£1300	5/10	5★	For a wideangle zoom, the overall level of resolution is very impressive			•							25	-	70	83.1	300g	
G 8mm Fisheye f/3.5	£730	NYT		The world's lightest and smallest fisheye lens for an interchangeable lens camera			•							10	22	60.7	51.7	165g	
G 12mm 3D Lens f/12	£320	NYT		Allows compatible cameras to shoot 3D images			•							60	-	57	81.8	45g	
G 12-32mm f/3.5-5.6 MEGA OIS	£270	NYT		Very compact with a versatile zoom range and 3 aspherical lenses	•		•							20	37	55.5	24	70g	
G X 12-35mm f/2.8 X PZ POWER OIS	£1095	10/12	5★	Fast, high-quality standard zoom for Micro Four Thirds cameras	•		•							25	58	67.6	73.8	305g	
G 14mm f/2.5	£249	NYT		Wideangle pancake lens which should suit landscape photographers			•							18	46	55.5	20.5	55g	
G 14-42mm II f/3.5-5.6 MEGA OIS	£375	NYT		Addition of two aspherical elements helps make this lens smaller than previous version	•		•							20	46	56	49	110g	
G X 14-42mm f/3.5-5.6 X PZ POWER OIS	£369	2/13	4★	Powered zoom; impressive results in terms of both sharpness and chromatic aberration	•		•							20	37	61	26.8	95g	
G 14-45mm f/3.5-5.6 MEGA OIS	£189	NYT		A lightweight and compact standard zoom featuring MEGA O.I.S. optical image stabilisation	•		•							30	52	60	60	195g	
G 14-140mm f/3.5-5.6 POWER OIS	£599	NYT		Metal-bodied zoom featuring company's POWER O.I.S. optical image stabiliser	•		•							30	58	67	75	265g	
DG 15mm f/1.7 Leica DG SUMMILUX	£549	NYT		High-speed prime with a compact metal body and includes 3 aspherical lenses to cut down distortion			•							20	46	36	57.5	115g	
G 20mm f/1.7	£300	NYT		High-speed prime (40mm is the 35mm camera equivalent) with 2 aspherical lenses			•							20	46	63	25.5	100g	
DG 25mm f/1.4 DG SUMMILUX	£550	2/12	5★	A fast-aperture fixed focal length standard lens from Leica			•							30	46	63	54.5	200g	
G 30mm f/2.8 Macro MEGA OIS	£300	07/15	3★	Compact lens offering true-to-life magnification capability for better macro images	•		•							10	46	58.8	63.5	180g	
35-100mm E f/4-5.6 MEGA OIS	£300	NYT		Telephoto zoom equivalent to 70-200mm on a 35mm camera	•		•							90	46	55.5	50	135g	
G X 35-100mm f/2.8 POWER OIS	£1099	NYT		Telephoto zoom with Nano Surface Coating technology for dramatic reduction of ghosting and flare	•		•							85	58	67.4	100	360g	
42.5mm f/1.2 Leica DG POWER OIS	£1399	Web	5★	Mid-telephoto high-speed LEICA DG NOCTICRON lens with 2 aspherical lenses and ultra-wide aperture	•		•							50	67	74	76.8	425g	
G 42.5mm f/1.7 POWER OIS	£349	NYT		Mid-telephoto lens with a 35mm equivalent of 85mm, its f/1.7 aperture promises a beautiful bokeh effect	•		•							37	31	55	50	130g	
G 45-150mm f/4-5.6 MEGA OIS	£280	2/13	4★	Compact, lightweight telephoto zoom comprising 12 elements in 9 groups	•		•							90	52	62	73	200g	
DG Macro 45mm f/2.8 MEGA OIS	£730	5/10	4.5★	Although maximum and minimum aperture are a tad weak, mid-range scores impress	•		•							15	46	63	62.5	225g	
G X 45-175mm f/4-5.6 X PZ POWER OIS	£400	7/12	4★	A powered long focal length zoom lens	•		•							90	46	61.6	90	210g	
G 45-200mm f/4-5.6 MEGA OIS	£330	7/12	4★	Superzoom lens with three ED elements and Mega O.I.S. technology	•		•							100	52	70	100	380g	
G 100-300mm f/4-5.6 MEGA OIS	£550	7/11	4★	Long zoom lens offering optical image stabilization	•		•							100	52	70	100	380g	

PENTAX CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount	Full frame only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						MOUNT										DIMENSIONS		
3.8mm-5.9mm (Q System) f/3.7-4	£429	NYT		Super-compact, ultra-lightweight wide zoom, equivalent to 17.5-27mm in the 35mm format						•				25	49	38	54	75g
8.5mm (Q System) f/2.8	£129	NYT		The standard prime lens in the Q system					•					30	40.5	48.5	48	96g
6.3mm (Q System) f/7.1	£129	NYT		A wide lens for the Q system					•						N/A	40.6	25	21g
11.5mm (Q System) f/9	£49	NYT		Extremely thin Mount Shield Lens equivalent to 53mm in the 35mm format, offering a distinctive, velvety image					•					30	N/A	6.9	40.8	8g
15-45mm (Q System) f/7.1	£249	NYT		Telephoto zoom covers focal lengths between 83mm and 249mm in 35mm terms					•						40	50	56	90g
18mm (Q System) f/8	£129	NYT		A telephoto lens for the Q system					•						N/A	40.6	19.5	18g
3.2mm (Q System) f/5.6	£149	NYT		A fisheye lens for the Q system					•					90	N/A	40.6	30.5	29g
5-15mm (Q System) f/2.8	£279	NYT		A short zoom lens for the Q system					•						40.5	45.5	23	37g
15-45mm (Q System) f/2.8	£279	NYT		A telephoto lens for the Q system that's super-compact and ultra-lightweight					•					100	40.5	56	50	90g

SAMSUNG CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount	Full frame only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						MOUNT										DIMENSIONS		
9mm f/3.5 ED	£149	NYT		At 12.5mm thin, this pancake lens is constructed of solid metal, made for the NX Mini only			•							11	N/A	50	12.5	31g
9-27mm f/3.5-5.6 ED OIS	£199	NYT		Versatile and compact zoom lens – NX-M mount for NX Mini only	•			•						14	40.5	50	29.5	73g
10mm f/3.5 fisheye	£399	NYT		Lightweight and compact, this versatile fisheye lens can be used with a wide range of Smart NX cameras				•						9	N/A	58.8	26.3	72g
17mm NX-M f/1.8 OIS	£160	NYT		Portrait prime lens designed with an NX-M Mount for the NX Mini	•			•						18	39	50	28	55g
12-24mm f/4-5.6 ED	£480	NYT		Portable ultra-wideangle zoom lens with i-function				•						24	58	63.5	65.5	208g
16mm NX i-Function f/2.4	£299	NYT		A pancake lens with a wide angle of view				•						18	43	61	24	90g
16-50mm f/2-2.8 Premium S ED OIS	£999	NYT		Bright-aperture zoom lens made of metal, with quiet AF performance whether shooting stills or video	•			•						30	72	81	96.5	622g
16-50mm f/3.5-5.6 Power Zoom	£279	NYT		Ultra-compact and lightweight design	•			•						24	43	64.8	31	111g
20-50mm f/3.5-5.6 ED II	£199	NYT		Ultra-compact lens with a retractable design. It's lightweight and an ideal optic for travelling				•						28	40.5	63.2	39.8	119g
18-55mm NX i-Function OIS f/3.5-5.6	£199	9/10	4.5★	Not an outstanding set of MTF curves but acceptable nevertheless. Weaker at 18mm				•						28	58	63	65	198g
18-200mm NX i-Function OIS f/3.5-6.3	£649	9/12	4.5★	A mid-range zoom lens aimed at movie making	•			•						50	67	72	105.5	549g
20mm NX i-Function f/2.8	£229	2/12	5★	Wideangle pancake lens				•						17	43	62	25	89g
30mm NX i-Function f/2	£249	9/10	4★	This pancake optic exhibits very impressive peak sharpness at around f/4-5.6				•						25	43	61	21	85g
45mm NX i-Function f/1.8	£249	NYT		Fast f/1.8 aperture produces a shallow depth of field making it ideal for portraiture				•						45	43	62	44.5	115g
45mm NX i-Function f/1.8 2D/3D	£399	NYT		Delivers high-end 3D capabilities with a large aperture and smooth autofocus system				•						50	43	62	44.5	122g
50-150mm f/2.8 S ED OIS	£1199	NYT		Premium zoom lens with advanced OIS, constant f/2.8 aperture, and dust and splash-resistant	•			•						70	72	81	154	915g
50-200mm NX i-Function ED OIS III f/4-5.6	£249	9/10	4★	Performance at the 50mm end is good, though this drops off at the tele end				•						98	52	70	100	417g
60mm NX i-Function Macro ED SSA OIS f/2.8	£499	2/12	5★	This prime lens with macro capability should be useful for portraiture	•			•						18	52	73.5	84	389g
85mm NX i-Function ED SSA OIS f/1.4	£849	4/12	5★	This prime lens is missing image stabilisation, but should still perform well				•						82	67	79	92	714g

SIGMA CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount	Full frame only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						MOUNT										DIMENSIONS		
19mm f/2.8 DN A	£189	NYT		Metal-bodied high-performance wideangle prime lens			•	•						20	46	60.8	45.7	150g
30mm f/2.8 DN A	£189	NYT		Uses a high-quality double-sided aspherical lens for expressive performance worthy of Sigma's 'Art' line			•	•						30	46	60.8	40.5	140g
60mm f/2.8 DN A	£189	NYT		Latest addition to Sigma's 'Art' range is a mid-range, high-performance telephoto lens with metal body			•	•						50	46	60.8	55.5	190g

SONY CSC

LENS	RRP	TESTED	SCORE	SUMMARY	Image Stabilisation	Canon M	Micro 4 Thirds	Samsung NX	Sony E	Pentax Q	Nikon 1	Fujifilm X Mount	Full frame only	Min Focus (cm)	Filter Thread (mm)	Width (mm)	Length (mm)	Weight
						MOUNT										DIMENSIONS		
10-18mm f/4	£750	8/13	4★	Super wideangle zoom with Super ED glass and Optical SteadyShot image stabilisation	•			•						25	62	70	63.5	225g
16mm f/2.8	£220	2/12	4★	Pancake lens for NEX system, with a circular aperture and Direct Manual Focus				•						24	49	62	22.5	67g
16-35mm f/4 ZA OSS Vario-Tessar T* FE	£1289	1/15	5★	Zeiss full frame wideangle zoom lens				•						28	72	78	98.5	518g
16-50mm f/3.5-5.6 OSS	£299	NYT		Compact lens with Power Zoom, ED glass and Optical SteadyShot image stabilisation	•			•						25	40.5	64.7	29.9	116g
16-70mm f/4 ZA OSS Vario-Tessar T*	£839	NYT		A lightweight, versatile mid-range zoom with a constant f/4 aperture				•						35	55	66.6	75	308g
18-55mm f/3.5-5.6 OSS	£270	NYT		Optical SteadyShot, said to be silent during movie capture, and a circular aperture	•			•						25	49	62	60	194g
18-105mm f/4 G OSS	£499	NYT		Sony G lens for E-mount cameras with a constant f/4 aperture				•						45	72	78	110	427g
18-200mm f/3.5-6.3 OSS LE	£489	NYT		Smaller and lighter than comparable lenses, this is an ideal high-magnification travel lens	•			•						50	62	68	98	460g
18-200mm PZ f/3.5-6.3 OSS	£999	NYT		Boasts powered zoom and image stabilisation with Active Mode, making it ideal for movies	•			•						30	67	93.2	99	649g
20mm f/2.8	£309	NYT		Pancake wideangle lens promises to be the perfect walkaround partner for E mount cameras				•						20	49	62.6	20.4	69g
24mm f/1.8 ZA Sonnar T*	£839	NYT		Top quality Carl Zeiss optic ideally suited to the NEX-7				•						16	49	63	65.6	225g
24-240mm f/3.5-6.3 OSS	£929	NYT		Ideal for travel, landscapes and more, with built-in stabilisation and also dust and moisture resistant	•			•						50	72	80.5	118.5	780g
24-70mm f/4 ZA OSS Vario-Tessar T*	£1049	NYT		Compact lens with an f/4 maximum aperture across the zoom range and built-in image stabilisation	•			•						40	67	73	94.5	426g
28mm f/2	£419	NYT		This full-frame wideangle prime with a bright f/2.0 maximum aperture promises excellent sharpness				•						29	49	64	60	200g
28-70mm f/3.5-5.6 OSS	£449	NYT		Built-in Optical SteadyShot image stabilisation, lightweight, and a popular zoom range	•			•						30	55	72.5	83	295g
28-135mm PZ f/4 G OSS	£2379	NYT		High performance G Series standard zoom lens, constant f/4 aperture, built for high quality moviemaking	•			•						95	95	162.5	105	1215g
30mm f/3.5 Macro	£219	NYT		A macro lens for the NEX Compact System Cameras				•						9	49	62	55.5	138g
35mm f/1.4 ZA Distagon T*	£1559	NYT		Full-frame ZEISS Distagon lens with large, bright f/1.4 aperture				•						30	72	73	94.5	630g
35mm f/1.8	£399	NYT		Lightweight versatile prime with Optical SteadyShot image stabilisation	•			•						30	49	62.2	45	155g
35mm f/2.8 ZA Sonnar T*	£699	NYT		When coupled with a full frame Sony E-mount camera, this prime lens promises to deliver				•						35	49	61.5	36.5	120g
50mm f/1.8	£219	NYT		A handy, low price portrait lens for the NEX range				•						39	49	62	62	202g
55mm f/1.8 ZA Sonnar T*	£849	NYT		35mm full frame prime lens with wide aperture allowing good images indoors or in low light				•						50	49	64.4	70.5	281g
55-210mm f/4.5-6.3 OSS	£289	NYT		Lightweight telephoto zoom lens for the NEX range	•			•						100	49	63.8	108	345g
70-200mm f/4 G OSS	£1359	10/14	4★	G Series telephoto zoom lens, dust and water resistant, with built-in image stabilisation	•			•						100	72	80	175	840g

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1080p
movie mode



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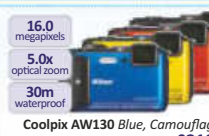
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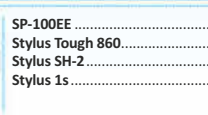
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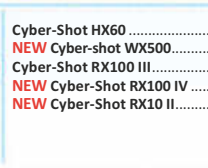
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7 Things Every Street Photographer Needs in Their Life

1 A camera that's usable one-handed

In street photography, you're not always going to want your viewfinder pressed up to your eye, or your camera held at arm's length while you peer at the LCD. It's the best genre of photography to practise shooting from the hip, and to that end you really want a camera that you can wield one-handed without inducing terminal RSI in your elbow or wrist.

2 A fast lens

In street photography you're capturing fleeting moments, often one-handed, and that means you may find yourself wanting fast shutter speeds. You don't need to spend hundreds or even thousands on premium f/1.2 lenses, but a good fast aperture is a useful friend to have. Pick a prime if you want sharpness, and focal length-wise, aim for between 28mm and 50mm.

3 Lens hood

With your camera swinging around amidst crowds of people, some form of protection for your lens is an extremely good idea. We'd recommend picking up a cheap lens hood to affix to the front – that way you also get the added benefit of prevention of flare from strong sunlight.



4 Spare batteries and a powerbank

This can never be said enough. The first time you run your battery down after ten minutes of shooting because you forgot to charge up should be enough to make sure you don't make this mistake again. Powerbanks are also a good investment, allowing you to give your camera a shot of juice on the go.

5 Light, efficient camera strap

You'll definitely want a camera strap, but what kind? Something light and unobtrusive is definitely the way to go for street photography, where your camera can hang loose by your side but be whipped into your hand at a second's notice for when that perfect moment shows up. If you don't know where to start, we'd say look at products made by Custom SLR or Blackrapid.

6 Cloud storage

As street photography involves being out on the move, a Wi-fi equipped camera that can transfer images to cloud storage via a phone or tablet will prove useful. Just stop in a coffee shop for a break, connect to Wi-fi, and you'll be able to quickly back up your images online. Dropbox, Google Drive, iCloud – experiment with the services available and see which works best for you.

7 A small, light camera bag

You don't want to be lugging around a heavy-duty camera rucksack. We'd recommend a small to medium shoulder bag – quick access, and more than enough space to keep everything you'll need for your excursions.



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The competition is split into three rounds, each with its unique theme: Nature, Time and Love. To enter, submit a video no more than five minutes in length, of HD quality. You can shoot on any camera you'd like, and the content and editing are up to your imagination – so long as it fits

the round's particular theme.

Visit www.thevideomode.com to view the top videos, as well as the scores and a leaderboard for the overall competition. The winner will be the person with most points after three rounds, who will win the overall prize as well as title of Amateur Filmmaker of the Year.

Round One: Nature

In this round we ask you to film nature from a new perspective. Look at the world around you – from urban foxes at twilight, to a spectacular sunrise – from a new angle and get creative with unique viewpoints. To see examples, go to www.thevideomode.com/examples.

Rounds and dates

Below is a list of the competition rounds, their themes and the dates you need to know. To view the results, visit www.thevideomode.com. When planning your entry, take into consideration the criteria of fulfilling the brief, creativity and technical excellence on which you'll be judged.

Theme	Opens	Closes
Round One: Nature	1 Aug	30 Sep
Round Two: Time	1 Oct	31 Dec
Round Three: Love	1 Jan	28 Feb

The overall winner will be announced in April 2016

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Round Two

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Round Three

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Overall prize

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THE **VIDEO MODE** In association with **Canon**

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...to our 20-page special, packed full of tips and techniques to help you get the most from your photography.

Whether you're new to taking pictures or have been shooting since childhood, we're sure you'll find plenty of expert advice to help you take your photography further.

Our tips cover all aspects of the image-making process, from must-know advice before you set off, right through to looking after your kit and editing your images once you return from a shoot. Not only that, but we've covered pretty much every genre you can think of in between, so whether you prefer to specialise in landscapes, wildlife or action, we've got it covered. Enjoy!

4 Basics

Whatever your subject matter, try these general tips and your photography will benefit

6 Landscapes

Improve your landscape photography with our selection of handy tips that will give your shots a more professional look

8 Macro

Want to achieve more successful close-up images? Our expert tips will help

10 Action

Get up on your subject, position yourself in the best possible spot with a camera prepped for the day, and get ready to roll

12 Wildlife

Improving your wildlife photography isn't just about expensive kit. Here's our selection of handy tips that won't break the bank

14 Portraits and lighting

Follow our handy hints to inspire your creativity and improve your portrait photography in little more than a flash

16 Street

Street photography can be one of the most exciting genres to try your hand at – so just follow these words of advice

18 Black & white

Thirteen tips to get the most from your black & white photographic techniques

20 Software

We can't promise to turn you into a computer whizz but these pointers can make life easier

22 Cleaning, protection and maintenance

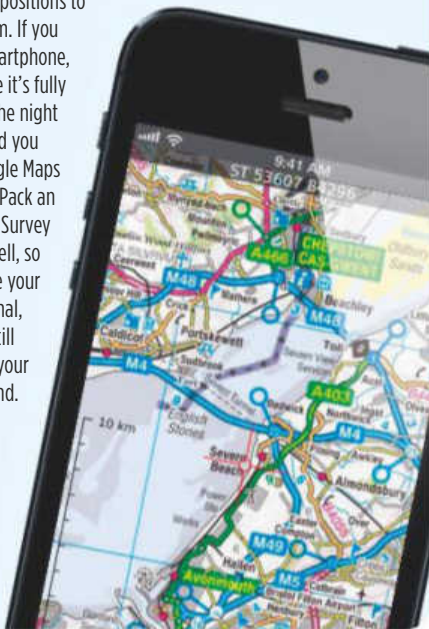
A look at how to keep your kit in tip-top working condition

Basics

Whatever your subject matter, try these general tips and your photography will benefit

1 Make a good plan

Before stepping out the door, it's vital to carry out some research and have a solid plan in order to achieve the images you're after. If you're venturing off to a location you've never been to, research examples taken by other photographers on photo-sharing websites such as Flickr, and make notes on the direction of the light and any angles or positions to shoot from. If you own a smartphone, make sure it's fully charged the night before and you have Google Maps installed. Pack an Ordnance Survey map as well, so if you lose your 3G/4G signal, you can still navigate your way around.



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2 Take a step back

The best shot isn't always the one where you're closest to the subject. Look around you before you fire the shutter, and where appropriate, take a few steps back to try to place your subject better in its surroundings. This often results in a unique image that portrays the subject in a different way than is perceived by many other photographers. You'll quickly start thinking more about composition, rather than snapping away like a tourist.

3 Keep your boxes

When you buy a new camera or lens, it's important (if space permits) to hold onto the original box, packaging and manuals. It'll be easier to ship should you wish to sell it later on and it will have a higher value than one without a box that's sold loose. The incentive to keeping your kit in great condition and caring for it, is that it'll be worth more and return a greater sum when you want to replace or upgrade in the future.



© PHIL HALL

4 Take a friend

Landscape photography can be quite a solitary pursuit. Forcing yourself out of bed at ridiculous o'clock in the morning for the prospect of standing out in the cold for a few hours is difficult, whereas having an agreed meet time with a buddy is much more likely to get you out and about at the crack of dawn for the best morning light.

5 Breathe easy

If you've walked a long distance, or have had to run to capture a quick spur-of-the-moment shot, chances are you'll be breathing more heavily. Heavy breathing can exaggerate movements and cause unsteady shots, so as an extra precaution you'll want to fire the shutter at the moment you exhale, which is when you'll be at your most relaxed.

6 Layer up

It's easy to look outside, misjudge the weather conditions and later find yourself wishing that you'd put on a few extra layers to keep

warm. Getting cold can be a reason to cut your shoot short, so if you find yourself regularly photographing outside during the coldest winter months, wear some warm thermals as a base layer. It's always easier to take off a layer or two if you're feeling too warm than to add layers you don't have, and wearing a hat will also help to preserve body temperature.

7 Shooting without a tripod

Tripods can be cumbersome items to carry and there will be times when you'll want to leave it at home to give yourself more freedom and flexibility. Even if your camera/lens combination has image stabilisation, you'll want to be wary of camera shake. Having firm, well-placed footing is essential, but avoid tensing the muscles as this will only lead to quicker fatigue. If there's a nearby tree, lean up against it for additional support and slowly depress the shutter – don't jab at it.

8 Backup body

One camera is good, but two cameras are better. There's nothing worse than finishing a four-hour drive to the Lake District only to discover that a problem with your camera makes the whole trip is wasted. Secondhand DSLRs make great backup bodies, but equally taking a compact, or having a smartphone to turn to with a few photo apps installed, will allow you to take some photos and mean your trip won't entirely have been in vain.

9 Stay hydrated

The importance of staying hydrated while you're out shooting with your camera shouldn't be overlooked. Water is vital for controlling body temperature, heart rate and blood pressure while you're out in the field, so instead of trying to cram another lens in your camera bag, make sure you allow room for a water bottle instead. Alternatively, buy a bottle pouch and attach it to your bag with a karabiner.





12 Venture to the coast

We're lucky in Britain to have one of Europe's longest coastlines, and no matter where you are in the country, you're never more than 70 miles from the sea. The relationship between land and water is a timeless classic, but before you set off and to prevent a wasted trip, it's always worth checking the time of the tides. We'd recommend bookmarking www.tidetimes.org.uk for future reference.



10 Insure your kit

Although it isn't compulsory like car insurance, insuring your camera kit from damage and theft is strongly recommended. In addition to regular home contents insurance, there are different deals to cover different photographers' needs. For example, professional photographers require professional cover to safeguard themselves against damage to persons or property as a result of negligence. It's worth shopping around to find a cheap quote before checking to see if a preferable company is prepared to match it.



13 Use your histogram

Your camera's histogram is the most useful weapon in your exposure arsenal and should be the final point of reference for exposing a scene. In simple terms, it's a graph for displaying the range of tones in a scene and it's the quickest visual way of identifying any clipped detail in highlights or shadows. You can usually overlay a small histogram on the live view image on the screen, or via the electronic viewfinder if your camera has one.



11 Shoot in the shade

While bright conditions are generally well liked by photographers, shooting in harsh sunlight can present issues with unwanted shadows. Using fill-in flash is one remedy to this problem, but if you're still struggling to make the light work for you, move into an area of shade where you'll be able to control the situation much more easily. If you're shooting portraits, the people you're photographing will be thankful they don't have to squint at the camera and you'll get a nice, even exposure as a result.



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Landscapes

Improve your landscape photography with our selection of handy tips that will give your shots a more professional look



© PHIL HALL

14 Long exposure

Get yourself a 10-stop neutral density filter, such as Lee's Big Stopper, and shoot a long-exposure image. The filtration will allow you to shoot with the sensor exposed for minutes in some cases, turning moving clouds into blurred streaks and rough seas into a smooth sheen. Include strong static elements to emphasise the effect.

15 Lead-in lines

Composing your image so the foreground has strong lines leading into the distance is an excellent way to create a sense of depth and perspective. This technique is strongest when the lines curve or come diagonally in from the corners leading to a distant point of interest.

16 Motion blur

Whether it's a field of barley or surf receding down the beach, introducing a sense of movement into an otherwise ordinary scene can make your shot that much more dramatic, especially when contrasted against something solid. In some instances, dropping



© JUSTIN MANN

17 Keep it simple

A clean composition can really make a strong image, so search for foreground and background subjects that complement each other, whether it be shape, colour or a visual link. Look around the frame for any distractions and adjust your position to remove them from your composition.



your shutter speed enough to record this movement means you may then need to shoot with a neutral density filter.

18 Focus stacking

For many successful landscape images, a huge depth of field is often desired, so it's natural to want to increase the aperture beyond f/16. However, at this aperture, sharpness can also suffer from diffraction. As an alternative, a powerful technique for extending the landscape's apparent depth of field is 'focus stacking'. Here, several differently focused images of the same scene are stacked together to produce a single, extended depth-of-field

composite image. And because you can shoot at a wider aperture, you'll be able to select your lens's optimal aperture (this varies from lens to lens, but is the lens's sweet spot where it renders the most sharpness). For landscape shots, take three shots: near focus, middle focus and far focus. You can then align the images in Photoshop by using Photomerge and selecting Blend Images Together and choosing the Collage option.

19 Don't fear the weather

While the golden hour can produce gorgeous colours and light, don't be put off when it clouds over, as the soft light can

23 Shoot at the golden hour

The best light for shooting landscapes occurs during the first couple of hours after sunrise, and late in the day as the sun is setting. At these times the sun is low in the sky, casting attractive shadows. And in the early mornings, fewer people are around, making it the very best time to shoot.

24 Try a telephoto lens

Try a telephoto zoom, such as a 70-200mm. A longer focal length compresses the distance between the foreground and background rather than exaggerating it. The narrow depth of field with telephotos allows you to de-focus the foreground, and focus in on your subject behind.



© JERIK HANSEN

© SWIN NUSIT



© JERIK HANSEN

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be perfect for waterfalls, details and woodland scenes. You can also use black & white for dark, moody skies – perfect for creating more atmospheric images.

20 Try infrared photography

Bright, clear days with rich blue skies aren't really suited to successful landscape images. That is, unless you're shooting infrared. Thanks to its unique characteristics, infrared photography can produce some truly beautiful results with a lovely ethereal quality. Bright blue skies absorb infrared light, rendering them almost pitch black, while foliage appears ghostly white, which results in a photo with real bite. Most digital

cameras will require an infrared filter (Hoya's R72 is a popular choice), though some prefer a dedicated camera conversion.

21 Shoot into the light

Shooting directly into the light can often produce more interesting shots than when you have the light behind you. For successful images, look to place an element between you and the sun, such as a building or tree.

22 Creative white balance

Rather than trying to achieve neutral colours in your image, don't be afraid to experiment

with the white balance, forcing warmer colours at sunrise or sunset, or emphasising cool blues in cold conditions.

25 Patterns

When shooting coastal scenes, low tides often reveal patterns and ripples in the sand that can potentially make a very interesting foreground. Shoot from a low angle to create a bold composition, ideally with some strong side lighting as the sun rises or sets out of the frame.



26 Research your location

As well as researching access to your desired location, check where the sun will be while you're there. The Photographer's Ephemeris (www.photoephemeris.com) offers a wealth of features, and if you're shooting at the coast or a tidal estuary, check local tide times.



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Macro

Want to achieve more successful close-up images? Our expert tips will help

27 Use a macro lens or a camera with a macro focus setting

Macro photography is about getting up close to your subject and showing the detail that's not immediately visible to the naked human eye. Subjects need to be magnified to 1:1 ratio – life-sized proportions or greater – for the images to be true macro images.

As far as macro lens selection goes, mid-range lenses of around 50mm are a more affordable starting point and will help you get used to the strengths and limitations of macro shooting. Mid-range lenses are good general-purpose options for capturing stationary/still-life subjects, but you will find yourself needing increasingly greater focal lengths as you start to shoot wildlife, such as butterflies, beetles and dragonflies. Macro lenses climb up in price quite significantly past 100mm, but if you can afford a 180-200mm macro lens, you'll find that many more shooting options become available to you, since you'll be able to focus on subjects in their natural habitats without having to get too close and disturbing them.



29 Environment

Elements surrounding your subject can help you create more interesting and arresting images, by helping to provide a stronger sense of place. Raindrops, for example, provide good contextual information and add an extra level of depth to floral macro shots, as the droplets act like miniature lenses as they pass over the veins of each leaf. I would also avoid shooting on particularly windy days, as blustery winds will frustrate your macro photography efforts exponentially.

30 Try using extender tubes

Extension tubes are another decent alternative entry into macro photography without investing too much money. Screwing into the rear element of the lens and then into the camera body, extenders



© ANCA ASMAR ANDREI

function exactly as their name suggests, giving some extra reach to your lens's focal length. However, be aware that the infinity end of the focusing range will be unavailable while you're using an extension tube.

31 Incorporate a close-up lens

If you don't want to splash out on a dedicated macro lens, buying a close-up lens instead can be a cost-effective alternative. These

32 Be patient

Patience is the virtue of all great photographers, but some areas of photography require more patience than others. Shooting wildlife, particularly winged wildlife that is rarely stationary, can be frustrating. However, if you find a location that is often frequented by your subjects, simply wait for that elusive butterfly to land on the branch you've patiently staked out for 20 minutes. In time, the perfect composition may unfold before you.



© STEVE GRESTY

28 Get to know your subject well

This is advisable in all areas of photography, but given the specialist nature of macro photography, knowing your subject intimately will help you capture its most striking characteristics. This is particularly true for living creatures, as their behaviour patterns can be difficult to anticipate.



© CATHERINE CORNES

single-element lenses screw into the filter thread of an existing lens and are available in +1, +2 and +4 levels of dioptre magnification to boost the reach of your lens's focal length. These filters can be combined with each other, to produce a range from +1 to +7. Dioptre lens elements are also available for Cokin's square-style filter systems.

34 Focus stacking

Sometimes using a narrow aperture to extend your depth of field isn't an option, as this will reduce the amount of light your lens can capture, forcing you to increase your ISO sensitivity or lower your shutter speed. If making these adjustments compromises your image quality, you could try the focus stacking technique. Using a tripod, you take multiple exposures of the same shot, changing the focus each time. The focused part of each image will contribute to a master image with extensive sharpness. After capturing the images, you can then stack them in post-production, as you would with an HDR image.



© BRIAN KENNIS



© NIGEL JONES

33 Master depth of field

Aperture settings can make a big difference to your macro photography results, either by using a narrow aperture such as f/16 or higher to show your entire subject in sharp detail, or using a wide aperture to separate your subject from the background, or to add impact by placing emphasis on one specific area of it.

35 Focus selection

If you do try focus stacking, you'll soon see the vast difference a subtle change in focus can make when working with close-up subjects. Shooting at wide apertures such as f/4 and below further enhances this impact, where slight shifts in focal point can create starkly differing images.

36 Clamps and clips

For subjects that you can manipulate and position freely, such as single flowers, carry a stand with a small arm or clip attachment that will give you greater control over your compositions.

37 Lighting

Ambient lighting may be sufficient in some cases, but throwing in some additional light that is under your explicit control can help to transform a good observational photograph into a striking image. There are different techniques that will work best for different subjects – for example, backlighting small details can work really well when lighting through the naturally diffusing surfaces of leaves.

You will also notice the benefit of having a longer-reaching lens when you start shooting macro,

because you will undoubtedly risk blocking light from falling on your subject if you're forced to be too close in order to get the shot. Added distance will help you avoid casting shadows over your macro subjects and it will also help you to see where including some additional lighting may help to enhance your photographs.



38 Manual focus

Macro photography involves dealing with very fine margins, and even changing focus slightly can produce dramatically different results. Indeed, having total control of your focusing is crucial.

Autofocusing, though quick at times, can be inconsistent, while another area in which manual focusing can be beneficial is pre-focusing. We discussed staking out locations frequented by your target subjects in tip 32. If you practise manually pre-focusing on a likely landing location, you will have a better chance of nailing

a fleeting moment, as your camera won't have the added task of attempting to simultaneously focus and release the shutter. This technique will require some practice, but once you're confident with manual focusing you will add an element of consistency to your work that will get you a higher ratio of usable results.

Some cameras have a manual focus assist mode that will magnify your selection to help improve your accuracy. Alternatively, try using a loupe during live view or when shooting via an LCD to enhance the subject.



39 Camera shake

Camera shake is the enemy of precision. If you want images that not only look great when reviewed on the back of a camera or on a negative, but also hold up to close scrutiny, you will want to avoid shake. Using a sturdy tripod will help, and if you're using a DSLR, shooting in mirror lock-up mode will also help. This raises the mirror momentarily before activating the shutter, which reduces internal shake caused by the mirror raising and slapping during exposures.



Action

Gen up on your subject, position yourself in the best possible spot with a camera prepped for the day, and get ready to roll



ALL IMAGES © PHIL HALL

40 Understand your subject

Knowledge is power and if you understand the sport or activity you're shooting, life will be much easier. You'll be able to anticipate what's going to happen and where best to position yourself. If you're new to the subject, try to brush up beforehand – so when you start shooting you'll have a much higher success rate.

41 Stay focused

It's very easy to spend the game or event in a dreamy mid-zone mentally when you're really enjoying it and you're happy with your camera, but actually you're not totally on the ball about getting that moment. Chances are there's going to be three or four occasions where there'll be some fantastic pictures right in front of you, but if you're not on top of your game, you'll miss it.

42 Be prepared

It's something that often gets overlooked, but be physically prepared. There's absolutely no way you'll come away with good sports pictures from an event if you're not physically ready to take the photograph. Be comfortable with your positioning – if you're shooting from the sidelines, a small collapsible chair is often necessary. Not only is it more comfortable than kneeling for long periods, but shooting at a lower angle will produce more dramatic shots. If you're using two camera bodies, make sure you can swap between them comfortably.

43 Focusing set-up

If you're shooting a sport such as football or rugby, set your camera up for continuous AF, and to keep things simple only use the central AF point where

44 Focus tracking

To aid precision of your camera's AF, use your camera's dynamic-area AF (also known as AF point expansion). This will allow your camera to use information from the surrounding focus points to maintain focus should your subject leave the selected focus point.

possible. Having done that, it's your job to keep the action in the centre of the frame. There's a huge amount of movement happening behind the player who has the ball and it's all very easy for the AF system to get confused. It doesn't know you want to focus on the player with the ball, so you need to narrow that down to one central point.

45 Back-button focusing

Rather than half-pressing the shutter to acquire focus, try back-button focusing. You won't have to keep switching between single and continuous AF – great for when a static subject suddenly moves. Set the camera to continuous AF and via its menu, disable AF activation from your shutter button, relying instead on the AF-on or * button. It keeps focus locked on a moving subject much better as you're depressing the back button without pausing, and you can hit the back button to lock focus for a static subject.



46 Use auto ISO

Auto ISO is useful if you're trying to shoot at a certain shutter speed and haven't got the sensitivity set high enough should the lighting change. For example, in the sunshine, ISO 400 is fine with a shutter speed of 1/1250sec, but as soon as your player runs into the shade, you'll need about ISO 1600. Set the camera to auto ISO, which will detect and adjust the need to increase the sensitivity.

47 Avoid distracting backgrounds

When shooting sport, the problem with smaller events is that there will always be areas of the pitch where the background will have something that's pretty much as distracting as can be. Get to your location early to look for the least distracting background so that when the action starts, you're in the right spot.

48 Anticipate the moment

In some instances, if you know where the action's going to unfold, such as a jump or corner, then switch to manual and pre-focus on that point. When your subject or subjects come flying past, rattle off a series of shots – and if you've got it right, you should walk away with a few pin-sharp shots.



49 Use a wideangle lens

While we naturally think of shooting with a telephoto lens for sport or action photos, allowing us to fill the frame, don't discount shooting with a wideangle lens too. You'll have to think a little bit differently, but they're great for telling a story and setting the scene. Try getting down really low or up high to introduce drama into the shot.



50 Slow-sync flash

If you're working in relatively poor light, then using slow-sync flash can be effective and introduce a sense of movement to your shots. However, make sure you have rear curtain selected, to freeze the subject at the end of the motion and introduce a natural sense of movement. Otherwise, it can look as if your subject is moving backwards.



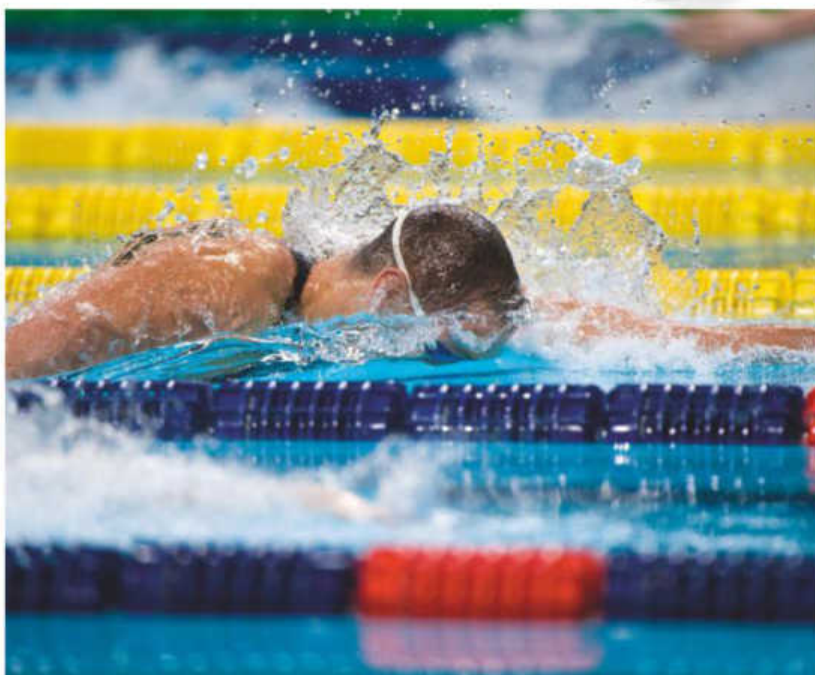
can have a negative effect – they'll try to correct for the panning movement. Make sure you've got the right IS setting selected either on your lens or camera – consult your manual if in doubt.

51 Panning and image stabilisation

We all know panning is a great way of introducing movement into your shots, but if you're using image stabilisation, some settings

52 Keep shooting

Don't miss a moment reviewing shots on the back of your screen. Keep on shooting because you never know what's going to happen or when, and then assess your images afterwards.



Wildlife

Improving your wildlife photography isn't just about expensive kit. Here's our selection of handy tips that won't break the bank



53 Choose the right lens

Wildlife photography requires specialist lenses, perhaps more so than any other subject. In general, you'll need telephoto zooms that combine long focal lengths with reasonably light weight, such as the Tamron 150-600mm

f/4.5-6.3 or the Panasonic 100-300mm f/4-5.6. For specialist work, long fast primes are preferred, but remember that there's little point in buying a huge lens if you're not prepared to carry it around.



56 Try using a superzoom bridge camera

If you don't want to lug around a huge camera and lens, try a superzoom camera. There's a significant image quality penalty, but with current models sporting lenses as long as 1400mm

equivalent or more, you do get an immense amount of reach in a very portable package. Higher-end models offer full manual exposure control, and are capable of shooting Raw too.



54 Use a remote trigger

Remote-shutter triggers can be useful for capturing an animal when you know it visits a specific location. They can be set up to automatically fire when an animal comes between an infrared transmitter and receptor, for example.

Radio releases can also be useful for setting up your camera and triggering it at a distance. If you have a camera that can be remote-controlled by Wi-fi, you can stay out of view while still seeing what the camera will shoot.



57 Use a hide

Animals tend to be wary in the presence of humans and will run away when disturbed. Using a hide allows you to get closer without disturbing your subjects.



55 Get to know your subject

There's no substitute for good preparation. Get to know your subject's movements, preferred location and the times of day when they're most active, and plan accordingly. Use this information to think ahead and anticipate interesting events.



© ANDREW STALLACE

58 Get some good binoculars

A decent pair of high-powered binoculars is invaluable for locating your subjects at a

distance. As with camera lenses, there's really no substitute for quality, and optical stabilisation can be invaluable too.

59 Get the right support

As wildlife photography usually requires large lenses, having the right camera support is essential. For mobility, a monopod is useful to help support the weight of your lens; if you're working from a vehicle, a beanbag may be more practical. If you're shooting from a fixed location or using a hide, a tripod is essential. For working with a large heavy lens, it's worth investing in a gimbal-type head.



60 Don't wear scents

Many animals have an acute sense of smell, and there's little point in sitting in a hide if your subject can still sense your

presence, as they'll be spooked and stay away. Avoid using smelly soaps or cosmetics before heading out to shoot. It's also best to stay downwind of your subjects if at all possible, to avoid them detecting your natural scent.

62 Select your shutter speed carefully

Think about the shutter speed you'll need for any given shot. If you want to freeze motion you'll need a fast speed of 1/1000sec or more; don't be afraid of using a high ISO to achieve this, as it's better to get a sharp, slightly grainy picture than one that's free from noise but blurred due to subject movement. For panning shots you'll want slower speeds, around 1/60sec or slower; this may require using a neutral density or polarising filter to limit the light.



© ANDY WESTLAKE

61 Be prepared to wait

Getting a good shot often requires plenty of patience, so be prepared to spend a lot of time waiting. This also means being suitably stocked with water and food, for example energy bars and chocolate.

63 Master focusing

Don't stick with letting the camera autofocus when you half-press the shutter button. If you know an animal often visits a certain spot, for example a bird's favoured perch, manually pre-focusing at that point can often work better. For tracking focus on moving subjects, many

photographers prefer to move autofocus actuation to a button on the back of the camera. When using autofocus, exploit your camera's AF points to the full. Move the selected AF area around to place the point of focus just where you want it – usually the animal's eye.



© ANDY WESTLAKE

64 Shoot wide and crop

Many subjects move quickly and erratically, which means that there's a risk they'll move out of the frame if you zoom right in using a long telephoto lens. With the high resolution of modern DSLR sensors, though, there's plenty of

scope for cropping, so it makes sense to frame wide with a view to cropping down to your final composition later. This kind of approach also allows you to place your subject better in the context of its environment.

65 Get up early

You'll often get the best shots if you're prepared to start early. Many animals, for example insects and

lizards, have to warm up under the sun before they can start moving around, which means they're easier to shoot early in the morning. Others are more active early, then disappear later in the day.

Portraits and li

Follow our handy hints to inspire your creativity and improve your portrait photography in little more than a flash



© PHIL HALL

66 Shadows create volume

This is how photographers give a three-dimensional feel to their subject, with the sense of seeing an image as an object in space, rather than projected on a flat surface.

Lighting from the side, above or below, by casting deeper and longer shadows, creates the sense of volume. Still life and product photographers use angular lighting for this reason.

Try 'Hollywood lighting' for a dramatic portrait. The way to achieve this is to position a light high above and slightly to the side of your subject, angled down, but not so much that the shadow from the nose is too long and deep.

67 Light source

The narrower the source, the harder the light. A broad light source lessens shadows, reduces contrast and de-emphasises texture. A narrow light source does the opposite. This is because, with a broad source, light rays hit your subject from more directions, which tends to fill in shadows and give even more illumination to the scene. The sun, which is around 109 times the diameter of the Earth, is a massive light source, but at 93 million miles away, takes up a very small portion of the sky and hence casts very hard light when falling directly on a subject.

68 Shutter speed

When working with studio flash lighting, your choice of shutter speed is less significant than with daylight. It must be fast enough to eliminate any ambient or background illumination and avoid camera shake. Be careful not to set a faster shutter speed than the camera's specified sync speed (around 1/125-1/200sec) or you will get black stripes cropping into your picture.

71 Homemade diffuser and reflector

Buy some PVC pipe around 10mm in diameter and with four right-angled joints, create a frame at a size to suit yourself – 1 x 1m is a good size to start with. Stretch white linen over it and you have

69 Home photo studio

You'll probably be surprised to hear that you don't need to spend thousands of pounds to get a decent studio lighting set-up. Elinchrom has good lighting kits for around £500 and its D-Lite To Go kit is worth considering, while Interfit and Lastolite have studio lighting kits starting at around £200. All come with two heads plus softboxes or umbrellas, so you can bounce and soften your light for more flattering and professional-looking portraits.



© ANDREW STEDMAN

70 Eye highlights

Portraits of people – and indeed pets and animals – are nothing if the eyes are flat and lifeless. Without a specular highlight or 'catchlight', the viewer isn't drawn into the true expression and mood of the subject, which the eyes so distinctly portray.

The shape, size and position of the highlight is important too, and much experimentation is required to acquire the perfect look, but starting with a simple silver reflector or lighting softbox should get you on the right track.

an instant reflector, diffuser and background. It's fantastic for placing in front of any light source to give that softbox effect for next to nothing.

72 Directional lighting

When you're shooting a portrait you may want to keep the light source close to the axis of the lens to suppress skin wrinkles, while

with still life images you may want side lighting to emphasise the texture of rocks, sand and foliage. Generally, the greater the angle at which the light is positioned to the subject, the more texture is revealed.

If you're photographing pets and you want to bring out detail in the coat or fur, then it's best to position the light low and to the side, not straight on.

73 Off-camera flash

If you want to get really creative with a flashgun (as opposed to your on-camera flash), try taking it off the camera. Using an extension sync cable or remote trigger, you'll be able to light your subject from either side, above or below, and this can create



ghting

74 Reflectors

Keep any white polystyrene sheets that come with packaging from items such as TVs and dishwashers, as they make great reflectors and you can't have too many.

To make an alternative type of reflector, crumple a big piece of aluminum foil, spread it out again, and wrap it around a piece of cardboard, with the shiny side out. It makes a good reflector that's not quite as soft in effect as polystyrene or white card, but is great for adding sparkly highlights.

stunning results, giving the impression that you've used an expensive studio set-up. Experiment with different positions to see how the light changes the mood of your portrait. You could even put coloured translucent objects in

front of the flash to give variations in colour.

75 Diffusion attachments

High-end flashguns often come with a translucent diffusion dome,

which looks a bit like a plastic ice-cream carton and fits snugly over the flash head. For a dirt-cheap substitute, tape some tracing paper or tissue over your flash window. You can cut a flash head shape into a Tupperware plastic box or milk container and experiment with slotting it onto the front.

77 Extra pair of hands

Many times I've set out to shoot a portrait and regretted not having someone with me to help. They could hold a reflector or steady a lighting stand in the wind, for instance, to give you the chance to concentrate on what you do best: important things like the rapport with your subject, composition of the image and attention to detail. It's easy to miss something important if you are darting around attending to the nuts and bolts of your kit.

78 Checklist

Whether you're off to the park to shoot a portrait or round at a friend's house for a studio session, it's a nightmare if you forget a vital piece of kit. Even hardened professionals have been known to forget tripods as well as lenses, so a neat printed checklist to suit your shooting requirements posted with your equipment will pay dividends and prevent a potential disaster.

76 Backgrounds

A distracting background in a portrait really draws your eye away from the subject – and it's not just the classic telegraph pole jutting out of a person's head. Bright colours and patterns are equally destructive if they are too sharp. Shooting with a wide aperture and decreasing depth of field takes care of most issues, but also remember to keep your backdrop simple.



© ANDREW STEWART



Street

Street photography can be one of the most exciting genres to try your hand at – so just follow these words of advice



© WILLIAM ROLLS

79 Exposure compensation

It's a good idea to look at your location as a setting for a stage production. Think of your subject as the actor and look at the way your light interacts with them, particularly on high-contrast days.

It's likely that your camera will pay too much attention to the darker parts of your shot. It will

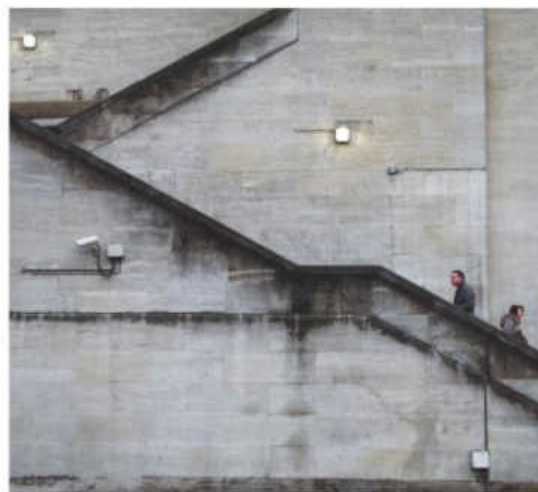
lighten the exposure to render the details of the darker areas while allowing the lighter areas to blow out. Underexposure can be fixed but overexposed highlights can be a horrible distraction. While you could attempt to read from the midtones, there is another option: exposure compensation. Using exposure

compensation is a critical skill on a bright, sunny day. If you employ exposure compensation, you can ensure the highlights are in all the right places and the shadows are a rich black. Underexposing your image, however, is a great way to create atmosphere (and silhouettes) within your image.

81 Lenses

Lens choice is also incredibly important. Many street photographers tend to stick to between 30mm and 75mm. The reason is that these focal lengths approximate what the human eye sees. The thing not to use in street

photography is a zoom lens. If you want to get closer to your subject, then walk there. It will give you a better perspective of the scene and it will also help to build your confidence as a street photographer.



© ALISON DE VILLERS

82 Location and framing

One of the great things about street photography is finding the right location or background and waiting for just the right character to walk into it. If you hang around long enough, a wide variety of characters will wander onto your stage.

While waiting, you have the time to ensure that you are photographing your location in the best way to represent your space. This ensures you don't miss that crucial shot when your

character enters. The most important thing to ensure is that you get your frame straight. When you're dealing with graphic shapes, you have to work with them, not against them. When a viewer looks at your image they will recognise a pattern, absorb it and then forget about it. They will then move on to the real point of interest: your subject. But if the shapes in your image are working against the frame, the viewer will be unlikely to look past that.

80 Working with light

If you place a subject under the light of an overcast day, you'll see that the light falls onto it from above and also reflects off the ground. The result is that the light will flatten your subject, making it difficult to achieve depth. Thankfully, there are a number of places you can find directional light in the city. In the image here, we see soft, natural light coming in from the right and good shade on the left. The photographer has essentially employed the sun as a sculpting light, as if they were in a studio. But instead of moving the light, they have shifted location to under a stairwell.



© MIKE CHAPRA-GANT

83 The right camera

When it comes to cameras, the general rule of street photography is 'the smaller, the better'. There are a few reasons for this: first, you don't want to stand out too obviously as a photographer; second, you don't want to carry around a load of heavy gear all day; and third,

smaller cameras look less professional to the public and therefore less threatening if your subject happens to spot you taking pictures.





© NIC VATES

84 Staying invisible

As we've said, the last thing you want to do as a street photographer is stand out in the crowd (so leave your tripod at home). If that happens the behaviour of your subject will change and you'll lose those beautiful candid moments.

While using a compact camera will get you some of the way to remaining invisible, there is another way to ensure you

remain unseen. One option is to shoot from the hip. If you don't raise your camera to your eye, people will not expect you to be taking pictures. If your camera has an articulated screen, this can make the task a lot easier. Ensure that your settings are correct in your camera and set your focus at around 2m distance and an f/8 aperture. This should keep everything in your image sharp.

87 Shadows

You can either see shadows as a passive element of your image or as the reason for its existence. They can create atmosphere or distort an image entirely. When photographers work with shadows, they tend to either shoot in the hours just after sunrise or in the late afternoon as the sun approaches the horizon, creating long shadows.



© GIGAN SHINJI SAKUMA

88 Dress appropriately

A simple but crucial tip: comfort is key for street photography, and that's particularly important when considering what shoes to wear. If you're thinking about your aching feet, you're not thinking about photography.

89 Bring spares

It's truly heartbreaking seeing a photograph-worthy scene reveal itself, only to realise that you're

either out of battery or have a full memory card. Always carry a couple of spare batteries and at least four or five cards.



85 The right position

There's one rule of photography that can help to add drama and narrative to your images: the rule of thirds. Positioning your subject nearer the edge of the frame adds tension and makes your image more exciting. If the subject is about to move out of the frame it creates a sense of movement; we can clearly see there is some action in the image.



© MIKE BETHUNE



© TIM ALLEN

90 Talk to people

While street photography relies on capturing candid moments, you can also take the option of approaching a subject and asking to take their picture. People will be more relaxed if they understand what you're doing and it's a good way of getting controllable, posed images.

86 Reflections

Reflections can be found everywhere. On rainy days, colours on the street saturate and bleed. The image becomes painterly and often abstract, particularly when the focus is on the reflection itself. But of course, reflections can be found in any weather, particularly in shop windows: a visual quirk that creates depth and mirroring to

balance an image. However, in this case the exposure is critical, as you're working with extremes of light – those outside and those inside buildings. Polarising filters can be used to correct this, although only if you're looking to shoot the action that's going on inside. If not, then it's a matter of waiting for the light to change or simply shifting your position.



© CAROL MCARDLE

91 Shutter priority

What is street photography all about? Capturing the action as it unfolds in front of you. That's why it really is best to keep your camera on shutter priority. Depth of field is great, but capturing a one-of-a-kind moment is more important.

Black & white

Thirteen tips to get the most from your black & white photographic techniques

92 Seeing in black & white

Black & white imagery is more than images that are devoid of colour. They have a different feel to them. The lack of colour can bring a different mood to the image and can lead our eye to different elements in the scene. Rather than looking at colour, look at contrast and elements of the scene that are lighter than others. Naturally, your eye will be drawn to these brighter areas.



© RICHARD SPREY



© PHIL HALL

93 Black & white high dynamic range

High dynamic range (HDR) images also work just as well when shooting in monochrome as they do in colour. Use a tripod and take three images of your scene: one exposure for the highlights, one for the shadows, and one for the midtones. Take the raw images and convert them into an HDR image as usual, then convert it to black & white. Done carefully, black & white HDR images can be quite striking.

94 Start a black & white project

To train your eye see good black & white images, give yourself a black & white project to start. It could be shooting landscape images, architecture or portraits – switch your camera to its black & white mode and start looking for images and subjects that will work in black & white. Try shooting in nothing but black & white for a weekend, a week or a month and see what difference it makes. It could improve your photography as a whole.

95 Shoot raw and JPEG

If you set your camera to shoot in its black & white image style, all the JPEG images will be saved in black & white. However, if you are shooting in raw and JPEG, then the raw images will be unaffected by the monochrome setting, leaving you with a full-colour version of the image that you can edit at a later date. So, you can visualise the scene in black & white, then make a precise black & white conversion from the raw image when editing.

96 Specialist software

If you find that you spend a lot of time making black & white conversions, specialist software can speed things up. Software such as Silver Efex Pro from Google Nik Collection, has a variety of different black & white image settings, as well as the ability to emulate 20 popular black & white film types. Visit www.google.co.uk/nikcollection/products/silver-efex-pro for more details. The company onOne Software (www.ononesoftware.com) has similar software called Perfect B&W 9, available for a free 30-day trial.

97 Use a polariser filter

Digital editing may provide many different effects, but there are some that you simply cannot replicate. A polariser filter works just as well when shooting in

black & white as it does in colour, darkening tones, particularly in skies, and reducing reflections in water.

98 Add grain to your digital images

Usually we do our utmost to avoid having digital noise in our images, but when shooting in black & white, some grain produces a nice effect that is reminiscent of shooting on film. However, rather than cranking up the ISO sensitivity, it is always better to shoot at as low a sensitivity setting as possible, and to add grain when processing an image.

Grain looks very different from digital noise and JPEG artefacts. There are plenty of ways to add noise and many software packages will have a dedicated feature or slider. Adobe Lightroom has a grain slider, but in Photoshop it is best to go to Filter>Noise>Add Noise and then

make sure that monochromatic is ticked, and select Gaussian. The amount of noise you apply will depend on the resolution of your image and the effect that you are looking for, but I would suggest that 4-8% is a good starting point.

99 Save your settings

If you regularly want to create black & white images, then it is a good idea to save a range of custom settings that you routinely use. When editing large numbers of images, it then becomes easy to apply your custom settings and convert your images to black & white.

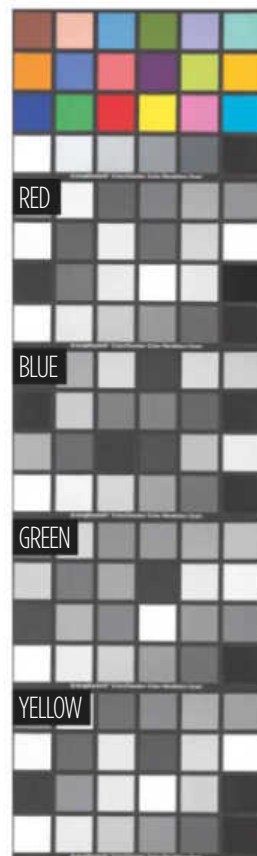
100 Don't just desaturate

The easiest way to convert an image to monochrome may be to hit Desaturate or work a saturation slider to its 0% position, but this won't produce

the best black & white image. Instead, use the different colour channels to your advantage. If you want a blue sky to look dark and moody, then use the red channel. If you want the blue sky to look very light, then use the blue channel. See tip 104 for more details.

101 Black & white portraits in overcast conditions

When the sky is dull and bland, it isn't a great time to take landscape images; however, it can be ideal for people shots. The clouds act like a giant softbox, creating a soft light with no hard shadows, meaning that it is great for portraits. So if your best-laid plans to get out and take landscape images have fallen foul of the weather, head out with a willing subject and take some black & white portraits instead.



104 Use colour channels when converting

When shooting with black & white film, different-coloured filters change the tone of colours when converted to black & white. By matching a coloured filter with a subject, certain colours can look lighter. For example, a green filter will make grass look bright. Conversely, using an opposing colour can make the subject look darker. A red filter will make a blue sky very dark, but skin will look brighter. A blue filter will make a blue sky lighter, but will make any skin blemishes appear darker. How you use different colours when converting to black & white depends on the subject of the image and the mood that you are trying to create.



102 Shoot on black & white film

Whether it has been a while since you have shot on film, or you never have, try shooting a roll of black & white film. Rather than clicking away on digital, you have to think more when using film, taking the time to compose and focus each image. The way you have to slow down when shooting on film is perfect for black & white, as it allows you more time to think about the contrast of the scene and how certain colours will look when converted to monochrome.

103 Choosing a black & white film

Obviously, the film sensitivity should be the first decision when purchasing a black & white film, but there are other characteristics to look for. Different films will produce different levels of contrast, different grain structures, and have slightly different responses to colours. Try shooting on a range of black & white films before deciding on the one you like the best. A good place to get black & white film is www.silverprint.co.uk, which stocks more than 30 different types.

Software

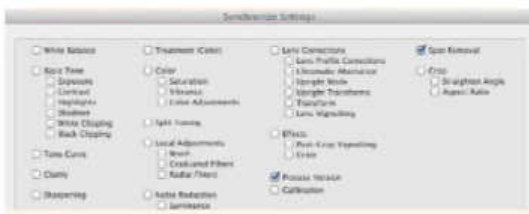
We can't promise to turn you into a computer whizz, but these pointers can make life easier

105 Use plug-ins

Software plug-ins add new features such as noise reduction, advanced colour toning or extra tools your software does not have. Most plug-ins are produced by third-party companies such as onOne Software. There are thousands available for Adobe Photoshop, Elements, Lightroom and Corel PaintShop Pro. Look for plug-ins that will help you speed up tasks that you perform regularly, or which add new features to your existing software.

106 Save a Lightroom preset

One of the most useful features in Adobe Lightroom is the ability to save a preset. This is an editing action you can perform and repeat at the click of a button. Once you have edited part of the image, for example adding a heavy post-crop vignette, hit the + button on the top



107 Remove dust on multiple images

If a number of your images have dust marks in the same place, you can remove them all in one go. In Lightroom or Camera Raw, use the Spot Removal tool to erase the mark and then, with all the other affected images selected, click sync.

108 Use guide lines

Guides can help you check if subjects are straight inside an image or if horizons are level. To put on guide lines, go to View> Ruler and drag and drop guides from the ruler at the edges of the screen.

109 Delete an anchor point

If an anchor point is getting in the way of the curve adjustment and it is preventing a selection of the curve from being adjusted by

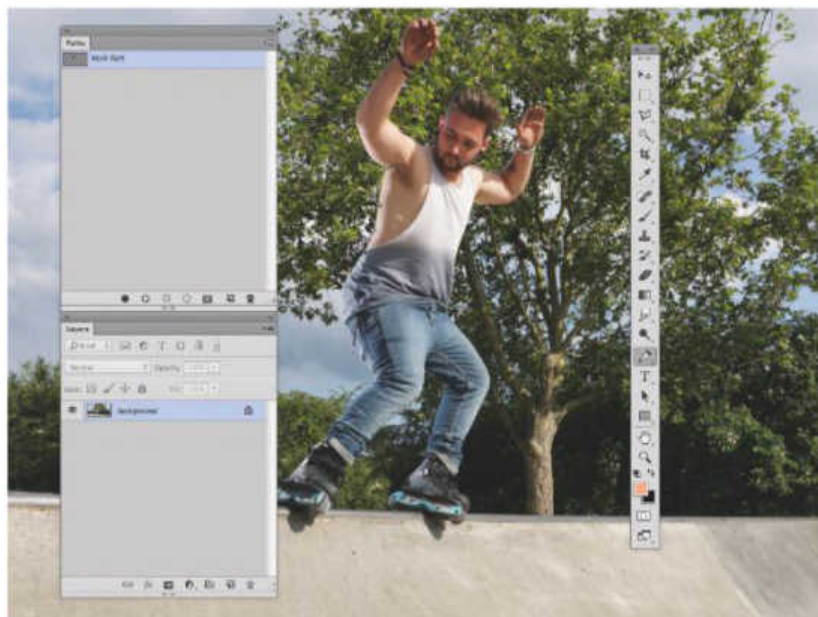
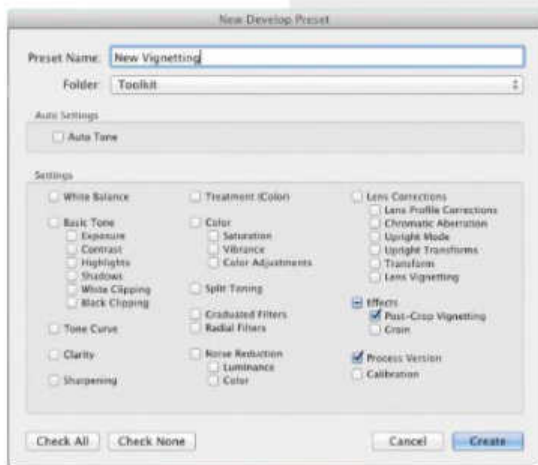
another point, it can simply be deleted. Either click on the point and hit Delete or drag it off to the side of the Curves panel.

110 Find a curve point

If a specific tone on an image needs darkening or lightening, it's possible to adjust it by clicking the mouse while holding Cmd/Ctrl on the area with a Curves adjustment open. This will create a curves point on the exact position that the tone is and can then be tweaked.

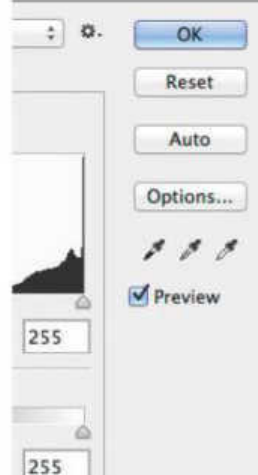
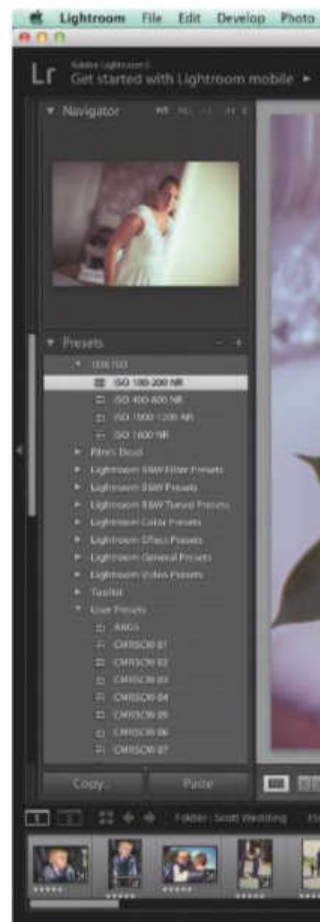
112 Use the Reset button

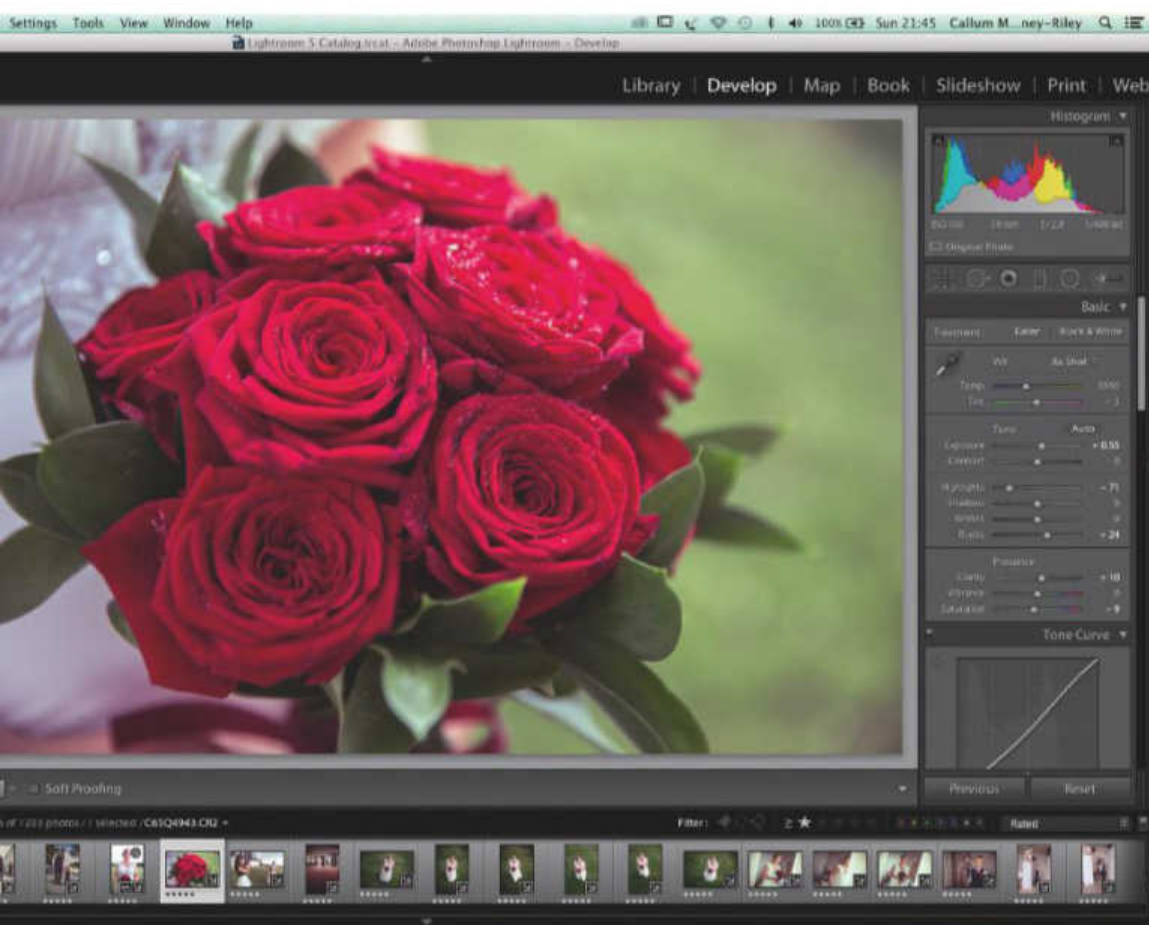
There's no need to cancel or close down a Curves or Levels adjustment and reopen the control palette if you make a mistake. Just press the Reset button, then revert back to the original and start again. In Photoshop, simply hold the Alt key to change Cancel to Reset.



111 Customise your workspace

Most editing software has a range of default workspaces available. However, it is a good idea to set up your own workspace that caters for the way you work and the size of your screen. Set up all the tool bars and palettes you wish to use and then, in Photoshop or Bridge, select Window> Workspace> Save Workspace. This will be saved and can be recalled at any time.





115 Rate your images

Most image library and cataloguing software, including Adobe Bridge, Lightroom and Apple Aperture, have a rating system. This allows images to be rated out of five. Once rated, users can filter images to see their best shots.

116 Use the clipping warnings

Some software offers the option to reveal clipping on the image as it is adjusted, which is useful when trying to avoid losing highlight or shadow detail. With Photoshop and Camera Raw, this can be activated by clicking on the arrows above the histogram, level with the black and white points. As shadows are darkened, black points will turn blue on the image. When highlights are clipped, they will display as red.

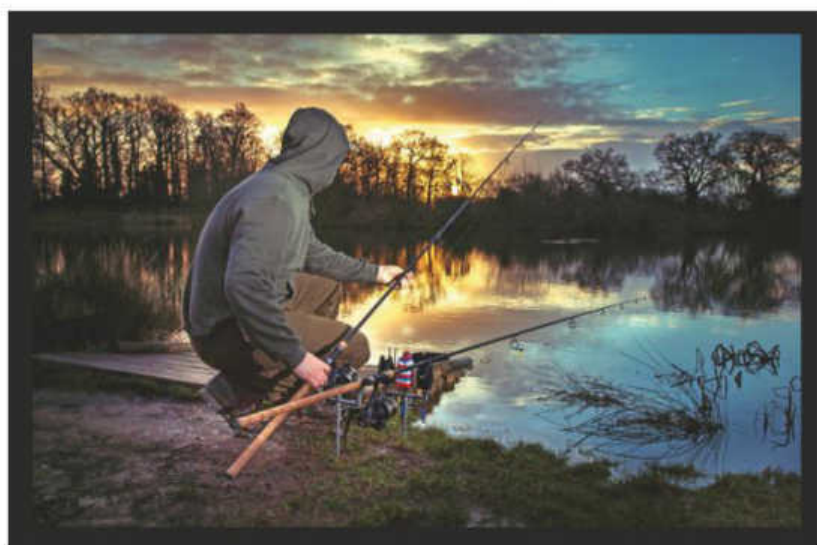
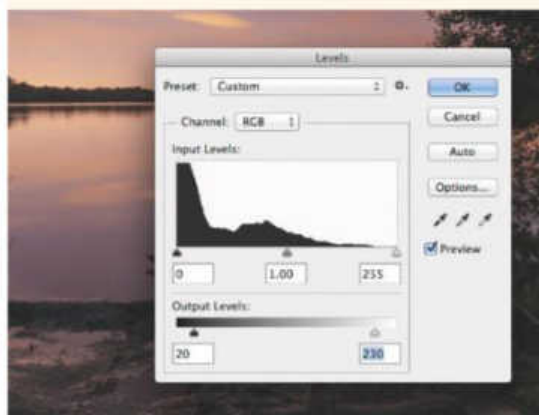
113 Use adjustment layers

Adjustment layers are extremely useful as they contain instructions about how to adjust a layer without affecting the pixels directly. Photoshop allows all the most common adjustments, including Levels, Curves,

Brightness/Contrast, Exposure and Colour Balance. The setting of the adjustment layers can also be changed at any time, even after the image has been saved and reopened, providing it is saved as a psd file.

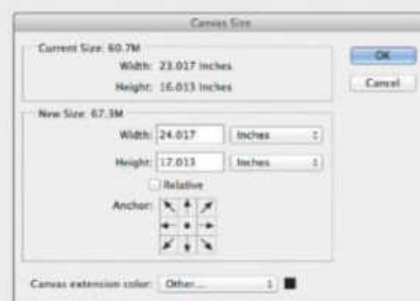
114 Avoid pure white and black tones

By default, the white points of an image are set to 255 and a black point is set to 0 in Photoshop. By opening Levels, it is possible to change the starting point of both. This is great for reducing the amount of white paper when printing images.



117 Add a border using Canvas Size

There's a quick way to add a coloured border to any image. Simply increase the canvas size by selecting Image > Canvas Size. Keep the anchor locked in the centre of the image and tick the relative box. Now just select the size of the border to be added, such as 1in to both the horizontal and vertical dimensions to add a 12in border. The newly created canvas will be filled with the current background colour, with the image placed in the centre.



Cleaning, protection

We give you some hints on how to keep your accessories – not just your valuable photographic equipment – in tip-top working condition

118 Keep dry

Waterproof covers can save you if you are photographing in stormy weather or get caught out in a sudden downpour. Durable covers cost around £20, but cheaper disposable versions are around £8 for a pack of two. Alternatively, keep a ziplock bag and an elastic band in your camera case. Put your camera in the bag and seal the bag around the lens with an elastic band.



120 Store your camera equipment in a suitable environment

Whether you keep your camera equipment in a drawer, cupboard or your camera bag, it is important to make sure that it is a clean, dust-free, dry and temperature-controlled environment. While keeping dust and dirt at bay is obviously essential, damp and moisture can be just as damaging. Fluctuations in temperature could lead to condensation, which could lead to fungus growing. To avoid condensation, allow your kit to acclimatise to an environment before taking it out of a bag. For example, when going from a winter's day to the inside of a hot car, put your camera in a bag before you get in the car. The same advice goes for when stepping from an air-conditioned room to a warm day in summer.

119 Put a filter on it

Protect the front of your lens with a skylight, UV or plain protection filter. These clear filters will have little, if any, effect on the exposure of your images, but will protect the front element of your lens. As well as protecting the lens from scratches, a protection filter could just save your optic from smashing should the worst happen and you drop it.



121 Control moisture with silica gel

Silica gel absorbs moisture – so it's a good idea to keep a few packets wherever you keep your camera, and, of course, in your camera bag or case. You can purchase silica gel from photographic or electrical stores for just a few pounds, but it can also be found in boxes when you purchase electrical goods. Rather than throwing these small packets out, put them to good use in your camera bag. How long the silica gel remains effective for obviously varies depending on the environment, but it is a good idea to replace the sachets every year. Some packets of silica gel have an indicator that will change colour when it needs replacing.



122 In an emergency

If you have got any of your camera equipment wet and are worried about potential damage, then remove the battery immediately. Put the camera or lens in a ziplock bag with some silica gel and leave it in there for 24 hours. If you have been caught in a rain shower then this should be enough to absorb any moisture, and it may just save an expensive repair if you have dropped your camera in water.



123 Use a beer cozy

Beer cozies are a great way to protect a lens. They are available in different sizes and the neoprene material means they stretch over most shorter-focal-length lenses. Available for just a few pounds, beer cozies can protect a lens when they are in your bag and also stop dust ingress through zoom or focusing barrels.

and maintenance



128 Clean and vacuum your camera bag

As your camera bag is exposed to the elements, it is vital that you keep it really clean. Regularly take out all of the insert dividers and vacuum them, along with the inside of the bag. Use a lint roller or some sticky tape to capture any lint and grit that the vacuum may miss. Use a slightly damp cloth to wipe the outside of your bag, and use a brush on any stubborn mud.

129 Clean your sensor in a dust-free environment

There is no point cleaning your sensor in a dusty environment. Make sure that windows and doors are closed so that there is no draught. Before cleaning your sensor, wipe any surfaces to pick up any dust. Remember that your sensor is usually only exposed for a fraction of a second at a time and any longer exposure leaves it more vulnerable to dust.

124 Put double-sided tape on the inside of your rear lens cap and body cap

A small tab of double-sided tape on the inside of a rear lens cap and body cap can help capture any dust particles and prevent them from settling on your lens, or inside your camera. Be sure to check and replace the tape when it gets dirty.

126 Check your insurance

Make sure you check your household insurance to see whether your photographic equipment is covered. Also ensure that your holiday insurance covers your camera and kit if you are abroad. Bear in mind that if you do any paid photographic work, your standard insurance may not cover you. For peace of mind, particularly if you have very valuable equipment, specialist camera insurance should be a consideration. See www.amateurphotographerinsurance.co.uk for a quote.

127 Don't forget a lens hood

A lens hood does more than help to prevent flare. It can help to shield the front element of a lens from rain, and even take some of the impact should you knock or drop the lens.

130 Clean your sensor

Cleaning your own sensor can seem daunting, but it is relatively straightforward so long as you follow the instructions for the type of kit that you are using. Perhaps the most important things to remember are never to touch the sensor, or the device you are using for cleaning the sensor, with your fingers. This can easily deposit oils and dirt upon it. If you are using a wet cleaning solution with swabs, only using the amount of cleaning solution recommended, and only use each swab once.

If you are still nervous about cleaning a sensor yourself, take it to a camera store, many of whom will be able to do it for you for a small fee. Just bear in mind that it is extremely difficult to remove 100% of dust that may be on a sensor, so at least ensure that any large particles in prominent positions are removed.

125 Be careful changing lenses

When you change your lens, you leave the inside of your camera vulnerable to dust. There is little you can do except minimise the risk by shielding your camera and lenses when changing them. When outside, try changing them inside your camera bag, or shielded by a jacket.



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